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SPECIAL OPERATIONS: SOVIET VIEWS ON U.S. METHODS

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[Article by Col A. Tsvetkov, Doctor of Military Sciences: "Combat Operations in the Enemy Rear." Articles enclosed in slantlines printed in boldface.]

[Text] The development of vigorous and decisive combat operations in the enemy rear is, along with the use of the most sophisticated means of destruction, one of the most important missions for command elements of the U.S. Armed Forces and those of other imperialist states. In the views of foreign military specialists, attacks on the enemy from the rear permit completing the defeat of major enemy groupings in a short period of time, seizing and holding important terrain areas, and disorganizing command and control and troop supply.

As emphasized in official military guidelines and manuals of capitalist countries, combat operations in the enemy rear in modern wars will be conducted primarily in the form of airborne, airmobile, amphibious landing and "special" operations.

Airmobile and airborne forces may be landed and used for accomplishing missions requiring a rapid move over relatively large distances: destruction of means of nuclear attack; seizing and holding airfields and important areas; a deep landing or raids by airmobile forces; surveillance of a large expanse of terrain to disrupt enemy airborne and airmobile operations; and the capture of cities, fortifications and strongpoints.

In the views of foreign military specialists, the modern /airborne operation/ is taken to mean the move of troops and materiel into the enemy rear by the resources of air force transport aviation for their accomplishment of combat missions beyond the front line. Airborne troops will, as a rule, be used for these operations. They are capable of being landed by parachute in the enemy rear and immediately entering battle. Infantry (motorized infantry) units and combined units trained for being air-landed sometimes may be used for these purposes. Transport aviation provides for the movement, support and MTO [logistical support] of the troops being landed.

Airborne operations are classified as lengthy (over three days) and brief (from several hours to three days). So-called raids and operations to isolate an enemy area of combat operations are placed in a special group.

As a rule, it is envisaged that lengthy operations will be conducted by major forces (several airborne combined units) reinforced in the course of combat operations by new infantry (motorized infantry) combined units and means of fire support. The purpose of such an operation is to seize and hold an important area in the deep enemy rear, from which it will subsequently be possible to develop offensive operations, seize state and military-economic installations, destroy major missile and air bases, and disorganize command and control and the supply of the main enemy troop grouping for the TVD [theater of military operations]. The depth to which airborne forces are landed may reach several hundred kilometers.

It is generally known that the Pentagon announced the formation of a major troop grouping (some 110,000 persons) for "defending American interests" in the zone of the Persian Gulf and other parts of the world. It is planned to move them chiefly by air. The conduct of a major airborne operation is being prepared even in peacetime.

It is planned to conduct brief operations ordinarily by smaller forces: one or two airborne combined units and sometimes even brigades. As a rule, they will be conducted without additional reinforcement of the landing force by air and should end with a relatively rapid link-up with forces attacking from the front. Their purpose is to capture and hold tactically important areas and lines in the enemy rear, aid in the landing of an amphibious force, destroy means of nuclear attack and special weapons depots, disrupt command and control and rear area operations, and prevent the arrival of reserves from the depth.

A raid is accomplished by limited forces (company to brigade). In its course it is planned to disrupt command and control, seize important positions, hills and installations, deliver strikes against active enemy subunits, destroy CP's and nuclear missiles, seize the latest models of combat equipment and important documents and so on. Taking into account that raids are connected not only with a troop move into an area of operations, but also with their evacuation therefrom, the foreign press more and more often is expressing the opinion of the advisability of using helicopters for this purpose.

It is assumed that operations to isolate an area of combat operations will take place in theaters of war with special physical-geographic conditions. Foreign military specialists believe that they will allow the disruption or prevention of the enemy's conduct of combat operations on terrain difficult of access. It is recommended that passes, defiles, crossings and road junctions be seized first of all to create favorable conditions for a subsequent offensive by friendly forces.

As noted in the western press, an airborne operation usually includes three phases: preparation and air movement, the landing, and conduct of combat operations in the enemy rear. Some countries break an airborne operation down as follows: preparation and boarding of transport facilities, air movement, debarkation and landing, combat operations on the ground. As a rule, the CIC of Joint NATO Armed Forces in the TVD or commander of a group of armies will direct major operations within the framework of the North Atlantic Alliance.

For a successful airborne operation thorough reconnaissance of the landing area is arranged, the make-up of echelons is determined (assault, follow-up, and rear), a forming-up place (for example, it can be 100 x 100 km for a division) and landing area (80 x 80 km) are chosen, the drop (landing) zones are determined, fire support is planned, communications are established, and troops are prepared for the landing and for performing combat missions in the enemy rear.

Foreign military specialists consider the landing to be the most complex and important phase of the operation. Special attention here is directed to the destruction and neutralization of the enemy in the overflight zone and the landing area, as well as dispersal of military transport aircraft in the air which are to fly to the designated area as part of flights along several routes. Direction usually is accomplished by the commander of the air transport unit during the air movement and landing and by the commander of forces being landed from the moment they land in the designated area.

As they land and are made combat-ready, the companies and battalions of the assault echelon must move out along the designated axes without awaiting complete assembly of the landing force and begin performing combat missions on their own. It is recommended that the attack be continued until objectives are captured which contribute to development of the further offensive or which ensure organization of a reliable defense.

With the arrival of the follow-up (main) troop echelon, vigorous offensive operations with air support may be begun for the purpose of expanding the captured area or organizing a perimeter defense.

In the estimate of foreign military specialists, the employment of tactical airborne landing forces is an important form of combat operations in the enemy rear.

From a company to a brigade may be included in the tactical airborne force depending on the nature and importance of the combat mission. But the optimum force is considered one made up of a motorized infantry (infantry) battalion with means of reinforcement, which is capable of operating on its own in a varying situation.

As pointed out in the foreign press, the primary missions of tactical airborne forces may be as follows: capture and holding of key terrain areas in the enemy rear until the arrival of troops from the front as well as destruction of important enemy objectives (mass destruction weapons, control points, depots and so on). The force is usually landed at a depth of 30-50 km with support of fire support helicopters, tactical aviation and long-range artillery. Nuclear attacks sometimes are delivered against the landing area.

After performing the combat mission and linking up with friendly forces, the landing force may continue to conduct combat operations along with them or may disengage from battle to prepare for a new landing.

In the opinion of foreign military specialists, the /airmobile operation/ represents a rapid, concealed move of airmobile units and subunits into the enemy rear aboard helicopters of army aviation, their delivery of attacks against selected targets from the ground and air and a rapid maneuver to new areas. It is believed that, being a component of ground operations, it will permit the command element to speed up the conduct of a maneuver and react swiftly to abrupt changes in the combat situation. It is therefore no accident that NATO armies attach serious importance to the use of the air space for moving troops and supporting combined units and units operating directly on the battlefield. Considering the positive qualities of combat and transport helicopters and the increase in their numbers in armies of capitalist countries, foreign specialists have performed much work in recent years to establish and outfit so-called airmobile forces and to elaborate the main provisions for their preparation and employment.

The American command believes that the present T/O&E structure of U.S. ground forces permits accomplishing rapid movements of infantry and artillery with the resources of army aviation, extensive use of fire support helicopters and reconnaissance by resources of airmobile subunits.

The distinguishing features of airmobile operations are surprise in troop actions, their rapid move over considerable distances, including zones of devastation and contamination, and the maneuverability and flexibility in performing combat missions and moving from one form of combat operations to another.

The foreign press points out that the most typical missions being accomplished by forces in an airmobile operation may be as follows: the capture and holding of individual terrain areas, destruction of important targets in the rear, seizure of bridgeheads on major water obstacles, interdiction of an organized enemy withdrawal, participation in the landing of amphibious forces and so on.

Depending on the nature and scale of the mission to be performed, tactical airmobile groups (brigade and battalion) may be formed, which include two primary combat components--a ground and an air component.

The brigade airmobile group usually is a resource of the army corps or airmobile division. In addition to the main battalions, it may include three or four helicopter battalions, a reconnaissance battalion, a combat engineer battalion and an artillery battalion. The battalion airmobile group, which most often will be used in the interests of an airmobile (mechanized, infantry) division, consists of a battalion of helicopters, a reconnaissance company, combat engineer company, artillery battery and other means of reinforcement in addition to the airmobile (motorized infantry, infantry) battalion. The brigade (battalion) airmobile group is divided in turn into battalion (company) tactical groups, and the latter into an assault echelon (reinforced combat subunits), follow-up echelon (main body) and rear echelon.

According to the experience of exercises and the aggressive U.S. war in Vietnam, the depth of an airmobile operation may reach from 40 to 100 km and its duration may be from several hours to several days.

The goal of reconnaissance is to collect or update requisite information on enemy forces and the terrain. As a rule, it is performed from the air, but in a number of instances small reconnaissance groups may be dropped to supplement and update previous information.

Foreign military specialists consider an important phase of the operation to be the move of an airmobile group from the embarkation area to the landing area, during which a high degree of security must be provided. For this purpose flight routes must be chosen over dispersed enemy combat formations or in the intervals between them. In addition, it is necessary to achieve air superiority and provide reliable air cover.

Helicopters usually will take off in flights from embarkation areas and the flight made as part of the company, primarily at extremely low altitudes. The remaining subunits proceed with an interval of 30-60 seconds after the helicopter company, which moves the assault echelon of the battalion airmobile group.

The mission of neutralizing and destroying air defense weapons in the overflight zone is assigned to attack helicopters (figuring one company of fire support helicopters per battalion airmobile tactical group) and tactical aircraft, primarily A-10A ground attack aircraft. During this time field artillery may conduct preplanned fire against enemy air defense weapons, his strongpoints and other objects hindering the flight of the airmobile group.

Nuclear strikes and strikes by fire support helicopters may be delivered and direct air support conducted prior to the landing of the airmobile group. It is recommended that the landing be begun under the cover of fire support helicopters in zones previously reconnoitered and marked by the vectoring group. Ten or twelve minutes usually are spent for landing personnel of the company of the group's assault echelon. Special antitank groups may be dropped to combat tanks, and they fight with helicopter support.

The airmobile group begins an attack by two methods: landing and immediate attack; landing, assembly, concentration, redeployment and the attack.

After seizing a designated object (or objects), the airmobile group usually consolidates it by making wide use of ambushes and minefields on approaches thereto, places itself in order, then continues to develop the attack.

In addition, as reported in the foreign press, the group's withdrawal from areas of combat operations is envisaged in any airmobile operation. The withdrawal will be supported by actions of helicopters, tactical aircraft and specially assigned screening subunits. Combat subunits withdraw to designated assembly areas and group according to helicopter loading variants. The last trip is used to move screening subunits.

Exceptionally great attention has been given to /amphibious landing operations/ in the postwar period, especially with the appearance of nuclear missiles, helicopters and new assault landing capabilities.

In the opinion of foreign military specialists, under present-day conditions these operations will be the primary method and in some places the only method of capturing major islands, strait zones and important targets on the enemy shore and for seizing the coastal zone of his territory on a maritime axis.

Depending on assigned missions and objectives, these operations are subdivided into the invasion, seizure (occupation) and raid.

An invasion is a strategic landing operation performed for the purpose of forming a new front on enemy territory and creating conditions for developing a major offensive from the captured beachhead. The use of different branches of the armed forces and combat arms is envisaged for participating therein (several army corps, airborne divisions and marine divisions).

The seizure is an operational landing operation consisting of the capture of a coastal sector, island or island archipelago primarily for supporting an offensive by the main body on a maritime axis. It is accomplished by the forces of one army corps or a marine expeditionary division with the inclusion of airborne division units.

The raid is a tactical landing operation in which form a marine battalion to a regiment is used. It has a limited objective--the temporary seizure of a small area, destruction of important coastal installations, and the conduct of reconnaissance and diversionary operations.

Joint forces usually are established (combined units and units of ground forces, naval forces and aviation), subordinated to a commander in chief, who may be appointed from any branch of the armed forces, for conducting the amphibious landing operation known as the "invasion." A joint combined assault unit, with a naval representative assigned to command it, is organized in accomplishing landing operations in the form of the "seizure."

Western military theorists deem it advisable to conduct amphibious landing operations both with the beginning of combat operations and in all subsequent phases of the war. The preparation and accomplishment may include the following phases: planning, embarkation of landing forces aboard ships and vessels, the conduct of exercise rehearsals (not always), the sea passage, the landing and seizure of a beachhead. The two latter phases are considered the most important.

As a rule, it is recommended that combat operations in amphibious landing operations be begun with strikes, including nuclear strikes, against air and naval bases, nuclear missile facilities and other important targets with resources of a carrier task force, marine aviation and sometimes strategic aviation. Then antilanding defense facilities are destroyed during air support and ships' gun support.

Reconnaissance clarifies depths of approaches to landing points and profile of the coastal zone, detects obstacles and barriers and so on ahead of time (two or three days).

According to foreign military press data, the frontage of an amphibious landing will depend primarily on the nature of enemy defenses and the need to disperse the landing force. For a marine expeditionary division it may reach 20-30 km (with a depth up to 40 km), 10-15 km (7 km depth) for the regiment and 2-3 km for the battalion.

The landing forces deploy under cover of aircraft and escort ships. At the designated time the amphibious warfare ships and vessels proceed to the area where waves of assault landing craft are formed, and then to the initial line for subsequent movement to designated landing points. In the majority of cases it is recommended that the first wave of the landings have landing boats and engineer vehicles for making passages, the second and third should have amphibious APC's with infantry, the fourth and fifth--landing craft and tank landing craft with heavy weapons, and the sixth and subsequent waves--personnel, tanks and artillery. Intervals between waves of the landing force usually are 3-5 minutes.

The landing of a tactical force aboard helicopters may take place simultaneously with the landing of forces by assault landing facilities in the depth of the planned beachhead 20-30 km from shore for the purpose of destroying important targets, seizing key positions and neutralizing the defenders' weapons.

In view of the fact that subunits and units will operate primarily in a scattered manner in the initial period of the landing, the planned beachhead is seized by their successive capture of a number of lines with extensive use of close and deep envelopments.

As shown by experience of exercises conducted abroad, the main body of an amphibious force usually attempts to develop vigorous offensive actions jointly with previously landed airborne forces after seizure of the beachhead or it shifts to consolidating the captured beachhead.

Considering the important role of amphibious landing operations in modern warfare, the NATO bloc command element devotes great attention to further elaboration of theoretical questions of their preparation and conduct as well as to combat training of fleets and the marines. An important place here is given to new methods of conducting combat operations and to swiftness and cohesiveness in the personnel's actions after coming ashore. Numerous exercises are used to practice problems of coordination of combined units and units of branches of the armed forces, including coalition forces.

In the opinion of foreign military specialists, the /"special operations"/ (or "special actions") represent a combination of reconnaissance, sabotage and other subversive actions in the enemy rear. Capitalist countries have formed so-called "special purpose" forces to accomplish this and their mission includes: collecting information on the most important enemy installations and their destruction, sabotage, terror, diversions, knocking together rebel detachments from those layers and groups of the populace which are dissatisfied to one degree or another with the existing regime, the conduct of subversive propaganda, spreading slanderous rumors, and carrying out punitive operations against patriotic forces in their own and dependent countries.

These actions usually are supported and directed by an appropriate agency from its own territory and conducted both in peacetime and wartime. According to their level, they may be conducted on an operational or strategic plane, and to increase effectiveness they may be supported by "psychological warfare" operations.

The "special purpose" forces usually set up an operations base on their own territory, from which they accomplish the planning, control, supervision and logistical support of operations by "special purpose" groups on enemy territory. During combat operations they frequently will be under the operational control of the commanders of army corps and commanders in chief of groups of armies. The "special operations" may have a primary or secondary purpose and may be conducted independently or in coordination with other forces.

The foreign press notes that views on the character of "special operations" and methods of employing "special purpose" troops in them have been further developed in recent years. First of all, there has been a considerable expansion in their range of employment (from conducting reconnaissance, performing diversionary actions and sabotage to "psychological warfare"); secondly, there has been an increase in the scale on which they are conducted (they have begun to be conducted at all echelons possessing appropriate forces and means and in all kinds of combat operations); thirdly, there has been an increase in their size (presently all major commands down to the CIC in a TVD have "special purpose" forces or sabotage-reconnaissance subunits similar to them).

The imperialist forces repeatedly have plunged the world's nations into the abyss of devastating wars. Even now they are not ceasing their vigorous military preparations, in which an important role is given to combat operations in the rear of the probable enemy's armies.

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CALCULATING COMBAT EFFECTIVENESS: SOVIET VIEWS ON NATO METHODS

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[Article by Col N. Bystrov, Candidate of Military Sciences, Docent: "Methodology for Calculating Troop Combat Potentials"]

[Excerpts] In connection with U.S. development of neutron ammunition for the Lance missile and the 203.2-mm howitzer as well as Washington's efforts to achieve the consent of West European countries for deploying new kinds of weapons in Europe, articles are appearing in the pages of the western press in support of these aspirations. The authors of such articles often attempt to prove that neutron weapons allegedly do not differ from conventional weapons, and that some kinds of nuclear munitions are even inferior to conventional munitions in their destructive effect, and so on. Based on this, they assert that the question of the "nuclear threshold"[1] already has been crossed off and removed from the agenda.

In the opinion of American General A. Haig, former CIC of Joint NATO Armed Forces in Europe, after conclusion of the SALT-2 Treaty neutron weapons will become the sole factor along with nuclear weapons for preserving NATO superiority over the Warsaw Pact in Europe.

In substantiating the need for outfitting troops with neutron weapons, the American military journal ARMY cites a hypothetical picture of unsuccessful combat operations by a U.S. division during the first two days of an armed conflict which has begun, and only the use of neutron weapons permitted disabling up to 30,000 enemy soldiers in a few seconds, which provided a radical change in the situation.

Apologists of nuclear weapons in general and of neutron weapons in particular took as one of their arguments the article by British chemist P. Robinson in which he cited certain mathematical calculations, wishing to emphasize the importance of establishing supervision over conventional weapons as well. In his comparative table individual kinds of conventional weapons were higher than nuclear weapons in destructive effect indicators. For example, this chemist includes highly toxic agents with a neuroparalytic action not in the category of mass destruction weapons, but conventional weapons.

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[1] In western military terminology, "nuclear threshold" is defined as the moment of transition from a conventional war to a nuclear war.

To determine destructive effect indicators of various kinds of weapons, Robinson applied a methodology elaborated and published back in 1964 by an American organization for historical studies and evaluations. Foreign specialists who participated in this work were not fully sure of the propriety of applying it to nuclear weapons, but they believe that there are no better calculations for now.

The essence of this methodology consists of a computation of potential combat capabilities (potentials) of subunits, units and combined units on the basis of a determination of the potential combat effectiveness of models of weaponry in their inventory. So-called theoretical indicators of combat effectiveness (TPBE) of kinds of weapons and coefficients of troop dispersal for various historic periods are calculated for this purpose.

The theoretical indicator of combat effectiveness is a numerical expression of the capability of a given kind of weapon to inflict injury on a certain conditional troop combat formation for a one-hour period. A conditional combat formation deployed across an unlimited front and to an unlimited depth (in any ratio) with a density of one person per square meter is taken as the conditional (theoretical) distribution of personnel on the battlefield.

The values of the TPBE for selected weapons determined in this manner are given below.

Weapon	TPBE Values
Rifles:	
Early 19th century	36
Late 19th century	153
Model 1903	495
Machineguns:	
World War I	3,463
World War II	4,973
Guns:	
16th century 12-pounder	43
105-mm	657,215
155-mm	1,180,681

Weapon	TPBD Values
Tanks:	
World War I	34,636
World War II	935,458
Fighter-Bombers	
World War I	31,909
World War II	1,245,789
Ballistic Missiles (V-2 Type)	3,338,370
Nuclear Warheads (Airbursts):	
20-KT	49,086,000
1-MT	695,385,000

American specialists assert that their methodology permits explaining a paradoxical phenomenon long known to historians: With an increase in the power of weapons the relative battlefield losses steadily decline. The press emphasizes that the reason for this is the dispersal of troops on the battlefield, which proceeds at faster tempos in comparison with the increase in power of weapons. The proposed methodology takes account of the coefficient of dispersal (Kr), which is the ratio of the number of persons in a combined unit (formation) to the density of its combat formation. They believe that by dividing the TPBE by the Kr it is possible to obtain the so-called test range indicator of combat effectiveness of weapons (PPBE).

The values of these indicators correspond to the maximum destructive capabilities of a given weapon under ideal conditions of its most effective battlefield employment with consideration of the historical period of its appearance.

The coefficients of troop dispersal in various historical periods are given in Table 1 [table not reproduced].

The TPBE's for various historical periods for the kinds of weapons enumerated above are given in Table 2 [table not reproduced].

In the opinion of American specialists, this information is interesting today not only from the standpoint of history, but also on a practical plane. They permit the NATO command element to determine the PPBE of an enemy weapon and compare it with a similar weapon of their own, and to estimate what might occur on the battlefield in case of a clash of corresponding forces, i.e., they make it possible to predict the outcome of battle and plan the necessary troop size.

As reported in the foreign press, U.S. military specialists have elaborated an algebraic model of combat, the KOM,[2] with which they describe actual combat operations in the past and hypothetical ones in the future.

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[2] See ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 6, 1978, pp 21-25, for more detail on this model.--Ed.

Under the proposed methodology they calculate the cumulative potential combat capabilities of weapons of a unit (combined unit, formation) and multiply this by the product of a number of coefficients denoting operational-tactical factors (mobility of the combined units and units, command and control, combat experience and others). As a result, they determine the numerical expression of the potential power of each side's forces: $P=S\cdot\prod_{i=1}^{n}\cdot Ki$, where S is the final test range indicator of combat effectiveness of a combined unit's (unit's) weapons; $\prod$ is the product symbol; n is the number of coefficients; Ki is the coefficient of the operational-tactical factor. The correlation of the sides' forces indicates the probable outcome of battle. The values of the Ki coefficients were derived by American specialists through the method of expert estimates on the basis of an analysis of numerous battles of the World War II period and wars in the Near East (1967 and 1973).

Table 3 - Cumulative PPBE's and Final PPBE for a U.S. Armored Division

Weapons	Number of Weapons in Division	Cumulative PPBE's
Rifles (automatic)	13,720	4,720
81-mm mortars	45	3,240
106.7-mm mortars	53	4,027
Dragon ATGM	135	15,525
Tow ATGM	90	19,260
203.2-mm self-propelled howitzers	12	2,484
155-mm self-propelled howitzers	54	10,746
Vulcan 20-mm six-barrel self-propelled AAA mount	24	7,416
Chaparral surface-to-air missile launcher	24	2,976
Red Eye surface-to-air missile	72	4,752
Medium tanks	324	296,460
Light tanks	27	14,013
Fire support helicopters	9	2,763
Final PPBE		388,382

According to foreign experts, such variable factors (Ki coefficients) as morale, terrain, weather conditions and certain others have changed insignificantly during the period from World War I up to the present time. But the power of weapons, mobility and other factors which seriously affect the TPBE and PPBE have grown substantially. For example, based on the cumulative PPBE indicators of the modern American armored division, the final PPBE for the combined unit equals 388,382 (Table 3), and it is around 450,000 with consideration of pistols, submachineguns, machineguns and rocket launchers.

By publishing such articles, militaristic circles in the West attempt to convince their readers on a "scientific" basis of the fact that the probable enemy has higher combat might and they thus attempt to justify a stepped-up arms race. By creating hypothetical variants of operations by their forces, American specialists also are trying to prove the need for being the first to employ nuclear weapons, which in their opinion ensures the achievement of advantages in combat.

With regard to the Soviet Union, its fundamental position is well known to all. From the first days of its existence the USSR has struggled steadily and consistently for general and complete disarmament. Its central direction in the struggle for peace under present-day conditions is a reduction in the threat of a new world war breaking out and of mass annihilation of people with nuclear weapons.

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TACTICAL AVIATION: SOVIET REVIEW OF U.S. DEPLOYMENT METHODS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 79 signed to press 10 Dec 79 pp 51-56

[Article by Col (Ret) G. Osipov, Candidate of Military Sciences, Docent: "Organization of U.S. Air Force Tactical Air Movements." Passages enclosed in slantlines printed in boldface.]

[Excerpts] Taking cover behind fabrications of the so-called "Soviet military threat," U.S. militaristic circles are intensively building up the might of all branches of the armed forces, including the Air Force, readying them to conduct an aggressive war, primarily against the USSR and other socialist countries. Tactical aviation is considered one of the main forces supporting combat operations of the ground forces. The Pentagon is conducting a number of measures to increase their strategic mobility for a rapid concentration of Air Force personnel and facilities on decisive axes.

According to foreign press reports, the American military leadership plans to move up to 90 squadrons of tactical aircraft from the United States to Western Europe in 60 days in case of war. But in connection with the fact that its allies consider such rates to be insufficient (in addition, in the opinion of some West European experts, the U.S. Air Force will be able to redeploy only a little more than 20 squadrons in the first 45 days), the United States pledged at a NATO Council session in May 1978 to increase these rates and by 1983 to bring in up to 60 squadrons as early as the first seven days.

On the basis of articles published in the foreign press, this article examines the goals, organization and accomplishment of tactical air movements being performed in the U.S. Air Force as well as their airfield and logistical support.

/Goals./ According to foreign press reports, subunits of American tactical aviation are moved from the continental United States to other TVD's [theaters of military operations] for reinforcing air groupings present there for the period of aggravation of a situation, performance of gendarme functions in combating a national liberation movement in various parts of the world, scheduled deployment of new air units and combined units, and for increasing the strategic mobility of tactical aviation (in the process of special exercises). The U.S. Air Force TAC [Tactical Air Command] has been practicing such movements from the mid-1950's. They attained particularly broad scope in recent years. All the main warplanes of tactical aviation participate in them, including the F-111 (Fig. 1) [figure not reproduced], F-4, RF-4, A-7, F-15 and A-10.

/Organization and planning of movements/ is accomplished in air units and combined units under the direction of the U.S. Air Force TAC headquarters. The following is planned: composition of subunits and reserve of aircraft and crews; deadline for preparing the flight; departure and destination airfields; routes, flight altitudes and alignment of subunits along the routes; number of tanker aircraft and number of in-flight refuelings; procedure for weather reconnaissance and control of the flight; safety measures; technical servicing personnel, materiel and organization; missions and deadlines for arriving in the other TVD.

As noted in the foreign press, it takes several months to plan the flight of one unit or subunit and to make immediate preparations for it.

American specialists note that difficulties arise in rebasing aircraft to European TVD's such as a difference in rules and terminology used in controlling aircraft in the United States and NATO, insufficient traffic capacity of communications lines and so on. In addition, U.S. Air Force pilots complain of the complexity of aircraft navigation at low altitude in Europe, the intensity of air traffic and the large number of limitations, particularly during instrument flying, which increases the time for preparing for the flights and even leads to disruption of some of them. In particular, according to foreign press data, 36 of the 140 sorties had to be aborted during flights of the aforementioned 70th AE [Air Squadron].

/Airfield and logistical support/ (MTO). In conformity with U.S. Air Force TAC plans for deploying tactical aviation in Europe, special air bases are assigned in European TVD's (in case of emergency) to the subunits or units flying from the American continent. Operating air bases of the U.S. Air Force and other NATO countries as well as a portion of the so-called "unequipped air bases" are used in peacetime for landings and subsequent flying operations.

/The accomplishment of movement/ by tactical aviation from the United States to other TVD's is examined in this article in the example of a flight by a group of F-4E aircraft of the 70th Squadron, 347th Air Wing from Moody Air Base (U.S.) to the FRG (published in the foreign press in late 1977).

Goals of the flight were to practice the movement from the United States to Europe, to check the concept of "joint basing" and combat readiness of crews, and to train in performing missions of direct air support under conditions of the Central European TVD.

The briefing presented above indicates once again that the planning and accomplishment of American tactical air movements as well as support measures for them are aimed at a rapid build-up in might of air groupings of the aggressive NATO bloc directed primarily against the USSR and other socialist countries.

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SUBMARINE OPERATIONS: SOVIET REVIEW OF U.S. METHODS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 79 signed to press 10 Dec 79 pp 69-76

[Article by Capt 1st Rank V. Flegontov, Candidate of Military Sciences, Docent: "Support to Combat Operations of American SSBN's." Passages enclosed in slantlines printed in boldface.]

[Text] Expressing profound satisfaction over the signing of the SALT-2 Treaty, broad international public circles note that its implementation will open up new opportunities for checking the race of nuclear arms and for realizing the supreme objective--complete cessation of production and elimination of nuclear weapon stockpiles.

But despite the spirit of the times, U.S. militaristic circles refer to a mythical "Soviet military threat" and continue to force the further development of strategic offensive forces, particularly their most important component--nuclear-powered strategic submarines.

In the opinion of the American command, the sea-based nuclear missile system most fully meets modern requirements placed on strategic forces. This system is constantly in a high degree of combat readiness, it is effective in its employment, and possesses heightened survivability, concealment of operation and accuracy of fire. At the same time it is emphasized that success in employing SSBN's will depend largely on support personnel and facilities and organization of control over their operations.

As the foreign press reports, support to combat operations of nuclear-powered strategic submarines is a system of measures aimed at creating the most favorable conditions for performing the missions assigned them. It is subdivided into combat (operational), navigational-hydrographic and rear area support.

/Combat support/ has the purpose of preventing a surprise enemy attack on friendly SSBN's, providing them freedom of action and making it possible to deliver a missile strike against planned targets promptly and under conditions most favorable for the friendly SSBN's. The U.S. Navy command includes among measures for combat support of SSBN's above all the following: reconnaissance, organization of patrol service, cover and deception, antisubmarine defense, air defense and other kinds of defense.

The western press notes that accomplishment of missions assigned to strategic submarines is inconceivable without a global system of reconnaissance and surveillance of the water environment and without the timely receipt of complete, detailed and accurate information on the enemy revealing the direction of his actions and reflecting events in real time.

Personnel and facilities of air, shipboard and space surveillance as well as communications and electronic intelligence and long-range sonar surveillance facilities are used to perform U.S. Navy reconnaissance in ocean and sea TVD's [theaters of military operations].[1]

Foreign military specialists believe that the chief threat to SSBN's stems from nuclear-powered attack submarines capable of accomplishing prolonged and concealed tracking of them. For this reason the battle against enemy submarines is given very careful attention. Nuclear-powered and diesel submarines, surface ships and ASW aircraft are used in this battle in close coordination with the SOSUS fixed passive long-range sonar surveillance system.

The organization of combat support for SSBN's envisages the hunting and killing of enemy submarines by attack submarines along the transit route of friendly SSBN's to their designated patrol area and on approaches thereto. It is also possible to use these [attack] submarines to simulate SSBN's for the purpose of diverting enemy ASW forces to false sectors.

Judging from foreign press materials, an important role is given to cover and deception, the missions of which are to lead the enemy stray with respect to the location of the SSBN's, to conceal the character and concept of upcoming operations and to provide surprise in their employment of weapons. Several kinds of cover and deception exist, the chief of which are communications, radiotechnical and sonar cover and deception. Radio and radiotechnical cover and deception is achieved by limiting or prohibiting the operation of radio and radioelectronic facilities, by using ultra-high-speed equipment and so on. Sonar cover and deception primarily assumes the use of sound-insulating and sound-absorbing materials, selection of low-noise speeds, concealment of the submarine under a temperature jump layer and use of target simulators. Western military specialists also include among cover and deception measures keeping command plans secret, misinforming the enemy, dispersing SSBN's and secrecy in moving to and from patrols.

As the foreign press reports, the United States is conducting extensive work under a program for ensuring SSBN safety which includes studies in the field of acoustics, hydrodynamics and magnetism. Large sums are spent on such work annually ($29.8 million in 1977 and $37.9 million in 1978).

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1. For more detail on this matter see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 11, 1975, pp 63-69 and No 9, 1978, pp 65-69.--Ed.

/Navigation-hydrographic support/ to combat operations of SSBN's has the purpose of creating conditions favorable in the navigational sense for precise and safe navigation of nuclear-powered strategic submarines and their employment of weapons and technical facilities. It includes the following measures: special reconnaissance of probable areas of upcoming combat operations for updating the hydrographic and navigational situation; navigational outfitting or additional outfitting of these areas; displaying the actual navigational situation on marine and special charts; additional installation of technical navigation gear aboard submarines; supplying them with charts, references and aids; arranging notification at sea on changes in the navigational situation.

As the foreign press emphasizes, the U.S. Navy gives special attention to outfitting submarines with modern navigational facilities and developing radio navigation systems. American SSBN's have the SINS Mk2 Mod. 3 and 4 ship's inertial navigation systems by which their current coordinates and direction of the plane of the true meridian are stored and presented. But in the process of navigation these systems accumulate errors in determining both the elements of fix and direction of the plane of the true meridian. Inasmuch as they affect precision in missile firing, the SSBN is forced to go up to periscope depth or a surface condition (on the average of every 12 hours) for updating her location with the help of other navigational facilities, which primarily include radio navigation systems (RNS): the Loran C pulse-phase hyperbolic radio navigation system, the Transit satellite radio navigation system and the Omega ultralongwave phased hyperbolic radio navigation system. Data obtained from them enter a specialized NAVDAC computer, which calculates elements of fix for the moment of observation and transmits them to the SINS Mk2 system.

Networks of the Loran C RNS stations are located on islands bordering the Norwegian Sea, on the Mediterranean coast, on islands in the northwest Pacific, in the vicinity of the Aleutians and Hawaiian Islands, and on the U.S. west and east coasts. The system (or its individual networks) has been in operation since the early 1960's. Each network consists of a master and several (3-4) slave stations. They operate in the frequency range of 90-110 kHz and provide a fix with an accuracy of 185-925 m at a range up to 2,000 nm.

Development of the Loran C RNS is proceeding along the path of intensive construction of new stations and improvement in the equipment. Three networks of the system were placed into full operation on the U.S. west coast in mid-1977. According to foreign press reports, their activation allowed bringing the accuracy of position fixing for SSBN's in the northern part of the Pacific at a distance of 1,000 nm from the stations down to 90 m.

It was planned to deploy two new networks in the vicinity of the U.S. east coast (four stations in each) by mid-1979. Subsequently they will be joined with a network in the north Atlantic.

The U.S. Navy has been using the Transit satellite RNS since 1964, with its receiver displays aboard all strategic submarines. It provides sufficiently high accuracy in determining coordinates (to 100 m), but this requires the SSBN to go up to periscope depth or a surface condition, which reduces her concealment (for obtaining data from satellites the submarine must hoist a receiver antenna at least 1 m above the surface of the water).

From four to six ISZ [artificial earth satellites] operate in the Transit system (the orbiting period about the earth for near-circular polar orbits some 1,075 km high is 107 minutes and the angle between planes is 60°). The interval between periods of receiving signals from the system averages 35-100 minutes (depending on latitude of the submarine's location). But western naval specialists note that inasmuch as the satellites are located unevenly in the orbits, the interval may reach 6-8 hours in the vicinity of the equator and 3-4 hours in the middle and high latitudes.

According to foreign press reports, the United States has developed a global space RNS called the NAVSTAR GPS (Global Positioning System), intended for precise determination of the location of objects on the earth's surface, in the ocean and in near space (by locating the point of intersection of three lines of position by distances to the ISZ and by registration of the precise moment in time); for controlling the movement of spacecraft; for trajectory changes in launching ballistic missiles and so on. It will permit the simultaneous receipt of signals from four ISZ's and their processing, and determination of locations with an accuracy down to 10 m continuously at any time of day or year regardless of weather conditions.

The space portion of the system will include 24 ISZ's (eight satellites each in three orbits, displaced 120° relative to each other, with each one's inclination 63°). The orbital altitude will be 20,000 km and the satellites' orbital period will be 12 hours. It is believed that six ISZ's should be constantly in the field of view at the equator, nine in the middle latitudes and eleven at the poles.

It is planned to implement creation of the NAVSTAR RNS in three phases. In the first phase (up to the fall of 1979) it is planned to test a system of six ISZ's rotating in two orbits (three in each). In conformity with the program four satellites were launched during 1978 and launches of the remaining satellites were planned for the first half of 1979.

In the second phase (1979-1981) it is planned to activate a system of 9-11 ISZ's. According to the specialists' calculations, it will provide for position finding of objects with an error of no more than 300 m.

In the third phase (1982-1985) the system should be fully deployed.

Construction of the Omega RNS is being completed. Eight of its ground stations are located across the entire globe. The system uses the SDV [ultralong radio wave] band, which permits receiving the radio waves at depths of 10-15 m. Each station emits radio waves on four carrier frequencies: a fundamental frequency of 10.2 kHz (intended for phase measurements), two subcarriers of 11.33 and 13.6 kHz on which the multiple values of phase measurements are eliminated, and a natural frequency (used for station identification and special kinds of measurements). The length of an operating cycle of any of the stations in the system is 10 seconds. The output of the radio transmitting devices is 10 kw. Maximum error in position fixing is 1-2 nm.

The Omega system was improved to increase the accuracy of determining coordinates primarily of warships and submarines (it employs the method of transmitting phase correction data of signals emitted by ground stations, which permits reducing error in position fixing to several hundred meters).

Meanwhile, as foreign military specialists emphasize, use of the Omega RNS in different areas has certain specific features. In particular, considerable difficulties arise in receiving signals from the stations by SSBN's located in areas of vigorous mixing of salt and fresh water as well as in the Arctic ices. In addition, as a result of their considerable size, the stations of this radar and especially their antenna arrays are vulnerable to modern means of destruction to the very same extent as the Loran C RNS stations.

In estimating the capabilities of ground-based and satellite RNS to support SSBN navigation, foreign military specialists note that with all the merits, these systems (with the exception of the Omega RNS) have a very essential shortcoming--they require submarines to go to periscope depth or a surface condition, which considerably reduces their concealment. It is believed that one of the ways to eliminate this is to equip patrol areas with special hydroacoustic responder beacons placed on the seabed. The foreign press reports that a special program of the U.S. Navy is developing an underwater emitter with signals which the SSBN's will be able to use to determine their location.

According to the western press, /rear area support of SSBN's/ includes naval bases and basing points with floating facilities, crew manning and training centers, ballistic missile arsenals, supply centers, shipyards and ship repair yards, missile test ranges, and ships for testing weapons systems and combat equipment of strategic submarines.

Direct support of the SSBN's is accomplished by service forces through a system of submarine basing, which consists of forward basing points located near combat patrol areas, and logistics bases on U.S. territory.

Forward basing points at Holy Loch (Great Britain) and Apra (Guam) were set up to provide the greatest coefficient of operational employment of SSBN's by reducing the time periods for their passage to combat patrol areas and to avoid locating installations on U.S. territory against which nuclear strikes would be delivered first of all.

Foreign military specialists note that all primary logistical support forces and facilities at forward basing points are concentrated on tenders, in docks and workshops, and aboard supply transports. In their opinion, because of this there is a decrease in the dependence of sea-based missile forces on shore installations and an increase in the survivability of the system as a whole. In case a threat of the beginning of military operations appears, all these mobile facilities are to put to sea or to previously designated anchorages where they will be able to load missiles, torpedoes and various supplies aboard the SSBN's and perform routine repairs and crew replacements.

Judging from western press data, the U.S. Navy has five SSBN tenders, of which two are of the "Simon Lake" Class ("Canopus" and "Simon Lake"), two are of the "Hunley" Class (the "Holland" and the "Hunley") and one is the "Proteus" (refitted in 1959-1960 from a "Fulton" Class attack submarine tender, Fig. 1 [figure not reproduced]). These tenders are large ships of special design (except for the tender "Proteus") with a displacement of 18,000-21,000 tons and with major capabilities for repairing all SSBN and missile systems and machinery. They have aboard repair shops, laboratories, depot facilities and stores of food, fuels and lubricants, spare parts (up to 85,000 descriptions), torpedoes and ballistic missiles (up to 20 missiles with nuclear warheads). Aboard the tender usually is the squadron headquarters and at the same time the crews of three or four SSBN's located at a basing point for restoration of combat effectiveness.

The cargoes needed for the SSBN's and tenders (missiles, torpedoes, spare parts, petroleum products, foodstuffs and so on) are delivered from the United States to the forward basing points by supply transports of the "Norwalk" Class ("Furman," "Victoria," "Marshfield" and "Norwalk," Fig. 2 [figure not reproduced]), refitted in 1963-1970 from "Victory" Class transports of World War II construction.

SSBN's are docked for the purpose of inspecting the underwater portion of their hulls, repairing outboard systems and performing other work in the floating docks "Los Alamos" (with a load-carrying capacity of 40,000 tons), "Oak Ridge" (30,000 tons, Fig. 3 [figure not reproduced]), "Alamagordo" (30,000 tons) and "Richland" (18,000 tons). All of them were built at the end of World War II.

The large naval bases of New London, Charleston and Pearl Harbor, which have repair capabilities and a complex of training and depot facilities, are used as logistical bases for nuclear-powered strategic submarines.

Ballistic missile arsenals at Charleston and Bangor (Washington state) hold an important place in the system of SSBN logistical support. Here they assemble, check and store ballistic missiles and torpedoes and issue and load them aboard strategic submarines going out on combat patrol for the first time as well as aboard special weapons transports making trips between the arsenals and forward basing points.

The SSBN receives all kinds of provisions at supply centers in Charleston (on the Atlantic) and Puget Sound (on the Pacific) via a special center for records and allocation of supplies in Charleston.

Major overhaul, modernization and refitting of strategic submarines are accomplished at naval shipyards at Charleston, Mare Island (California), Portsmouth (Maryland) and Puget Sound (Washington state) and by contract at shipyards of private companies at Groton (Connecticut) and Newport News (Virginia).

In the opinion of American military specialists, with the introduction of the Trident nuclear missile system into the Navy's SSBN order of battle the role of forward basing points will decrease gradually. They assume that thanks to the long range of the Trident 1 (over 7,000 km) and Trident 2 (over 11,000 km) missiles the submarines usually will be located near the shores of North America and will be provided with everything necessary from bases located directly on the continent. At the present time construction of an SSBN base at Bangor and their basing point at Kings Bay (Georgia) is under way.

Western naval specialists believe that one of the most complex problems of employing nuclear-powered strategic submarines is /organization of control/ over them. This primarily involves the fact that the SSBN's are in a submerged condition in the combat patrol areas and significant distances separate them from the command post.

The American naval command places such requirements as stability, efficiency, flexibility, reliability and secrecy on the system of control over nuclear-powered strategic submarines. Combat control of the SSBN's is exercised by the Chiefs of Staff Committee through the CINCLANTFLT and CINCPACFLT, and control of daily activities is exercised by commanders of submarine forces of these fleets through commanders of the submarine units with the help of a special radio communications system.

It is generally known that communications with submarines in a submerged condition is accomplished chiefly in the ultra-longwave (SDV) band and only in the "shore-to-submarine" link, which is explained by the capability of radio waves in this band to propagate over great distances (regardless of ionospheric storms caused by solar activity or nuclear bursts) and penetrate the ocean depths.

Shore-based ultra-longwave transmitting centers are the primary element in the system of radiocommunications with SSBN's, and the EC-130Q[2] relay aircraft are the reserve element. According to foreign press data, the transmitting centers are located both on U.S. territory (in the states of Maine, Washington and Maryland) and beyond (the Hawaiian Islands, Panama Canal zone, Australia and so on). They are equipped with enormous antenna systems which are easily vulnerable to enemy attack, and control of SSBN's is interrupted when they are disabled. In connection with this the U.S. Navy Command set up a reserve (back-up) system known as TACAMO for communications with the SSBN's as a supplement to the shore-based transmitting centers. The EC-130Q relay aircraft comprised its basis.

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[2] For more detail on them see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 4, 1976, pp 82-84.--Ed.

Foreign naval specialists believe that such aircraft are more difficult to detect and destroy when on combat watch in the air than are the shore-based transmitting centers.

But in the opinion of the U.S. Navy command, even this system of radio communications does not fully meet the demands placed on it, and so the problem of providing reliable communications with submarines continues to hold an important place in scientific studies of American naval specialists. Creation of a system of radio communications in the ultra-low frequency band (down to 80 Hz) is one of the ways to resolve it.

At the present time, judging from western press articles, the United States is developing an ELF (Extremely Low Frequency) system which is to operate at a frequency of 72 Hz. According to estimates of the U.S. Navy command, it will increase reliability of radio communications with SSBN's as well as their secrecy.

Implementation of the aforementioned programs (construction of new bases, deployment of RNS and control systems), aimed at increasing the effectiveness of employing SSBN's--one of the primary means of aggression of the U.S. ruling circles--once against attests to the fact that the U.S. imperialists are continuing to follow a dangerous course of building up arms and militaristic preparations.

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SONAR SYSTEMS: SOVIET REVIEW OF U.S. DEVELOPMENTS

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[Article by Capt 1st Rank V. Irinin, Candidate of Military Sciences, Docent: "Prospects for Development of Sonar Underwater Surveillance Systems in the U.S. Navy"]

[Text] Considerable attention is being given to the development and build-up of ASW forces and facilities in the overall system of aggressive preparations by U.S. imperialist circles and their NATO allies. Considering the complexity of hunting and killing submarines, NATO military specialists believe that antisubmarine warfare can be successful only if the problem of continuous effective surveillance of the ocean's water expanses is resolved.

According to foreign press data, the United States is setting up a global antisubmarine surveillance system. Its basis is the centralized collection of information on the underwater situation from all forces and facilities located at sea, in the air and in space. As the foreign press notes, an important role in the initial detection and classification of underwater targets is given to facilities of the SOSUS (Sound Surveillance System) fixed long-range sonar surveillance system.

The work to develop the SOSUS system began in 1950, when the American Navy began placing a network of hydrophones on the continental shelf along the U.S. east coast, connected by underwater cables with shore receiving posts, in conformity with the "Caesar" program. The posts used electronic computers to process sonar data by separating out the useful noises and determining the location of submarines from them.

In the following years similar networks were deployed along the U.S. west coast, in the Caribbean, in the Gulf of Mexico, along the Aleutian chain, in the vicinity of the Hawaiian Islands and in part of the Atlantic adjacent to the shores of Portugal and Great Britain. The foreign press reports that at the present time the United States has 22 shore receiving posts.

In the opinion of the American naval command, the existing system of underwater surveillance does not fully meet present-day requirements, above all from the standpoint of rapid processing of the data being collected, precision in fixing the position of submarines and supporting the prompt employment of weapons against them. For this reason the United States is conducting extensive work within the framework of integrated programs and individual projects for further development and improvement of means and methods of submarine detection and the collection and processing of sonar data, as well as to increase the efficiency of using the data being received.

/The work of developing and improving sonar means and methods of detecting/ submarines in the U.S. Navy is associated in a number of programs: "Sea Guard," "Lambda," LRAPP, TASS, RDSS and SASS.

The "Sea Guard" program envisages the development, manufacture and testing of wide-aperture antennas using special methods for receiving sonar signals and presenting data for processing with the help of electronic computers. Judging from foreign press reports, at the present time an antenna array of very large dimensions is being developed, designed for detecting submarines at low frequencies. It is supposed to pick up the sounds of the turbulent flow which appears behind a moving submarine.

Under the "Lambda" program a passive acoustic antenna array has been developed for receiving signals in a narrow frequency band. In addition, the program is studying the possibility of developing highly directional antennas for the low and medium frequency bands. In the opinion of western military specialists, this will permit the practically continuous tracking of targets (even low-noise targets) in a near-real time frame. The dimensions of certain types of antennas approach 600 m and methods of phased processing are used in processing the signals, which precludes the need for changing the antenna's position while tracking targets. The concept of a wide-aperture antenna array towed by a ship also was developed under this program.

The LRAPP (Long-Range Acoustic Propagation Program) is a program for studying ultra-long range propagation of sound energy.

The TASS (Towed Array Sensor System) program includes questions of developing, testing and introducing aboard naval ships a family of sonar sets with towed antenna arrays. As reported by the foreign press, at the present time three main directions of work to develop towed antenna arrays have been clearly defined within the framework of TASS: for submarines (the STASS, or Submarine TASS, project), for surface ships (TACTASS--Tactical TASS) and for special sonar surveillance vessels (SURTASS--Surveillance TASS).

A towed antenna array for the AN/BQQ-5 sonar system has been developed during the implementation of the STASS project. Processing of sonar signals within the system is accomplished with the help of a standard minicomputer and its read-out provides a three-dimensional display of the underwater situation.

The AN/SQR-19 sonar is being developed in conformity with the TACTAS [sic] project. As reported by the foreign press, it will make it possible to detect, classify and determine the location of submarines under any conditions of the environment.

Project SURTASS plans the building of 12 special T-AGOS vessels outfitted with sonar systems and towed antenna arrays in 1979-1982. They will have good sound insulation and a system of motion stabilization. The length of the towed antenna arrays will reach 1,800 m. This, in the opinion of foreign military specialists, will permit tracking the latest low-noise submarines.

It is planned that the vessels will be used in those parts of the ocean where fixed surveillance facilities have not been installed or where their effectiveness is insufficient. The data from them will be transmitted to control center computers for processing and classification of contacts.

Under the RDSS (Rapid Deployment Surveillance System) program a positional sonar surveillance system is being developed. It is based on the use of anchored sonobuoys (RGB) dropped from an aircraft. They have longer periods of operation (up to 90 days) than the RGB being used at the present time by the U.S. Navy's coastal patrol aircraft. These buoys will be equipped with a device for storing data on submarines. The data will be transmitted to shore collection and processing centers by radio to ISZ [artificial earth satellite] (or aircraft) on request or independently.

American specialists assume that the RDSS will resolve the problem of precise position fixing of detected submarines and will make it possible to exert combat pressure against them in short periods of time after the beginning of combat operations at sea. It is believed that the RDSS will supplement the SOSUS fixed long-range sonar surveillance system and will find wide application on the Greenland-Iceland-Great Britain line and in other parts of ocean and sea TVD's [theaters of military operations].

The SASS (Suspended Array Surveillance System) program envisages development of a fixed system of sonar surveillance over future low-noise deep-submergence submarines. As reported by the foreign press, it will consist of a number of support towers set up every 8-10 nm on elevations of the seabed at depths down to 6,000 m. Hydrophones and hydrophone arrays located on these supports are to help determine the direction to the source of noise emission. As a result of machine processing of signals coming from each hydrophone array, the range and consequently location of the target can be calculated ashore based on the signal's direction and attenuation. Accuracy of the fix will rise considerably if data from several arrays are used. In the opinion of western military specialists, the SASS system may become one of the most effective means for submarine detection.

Simultaneously with the implementation of the aforementioned programs, aimed at improving existing sonar facilities and developing new ones, the

U.S. Navy is performing extensive research in the field of developing /non-acoustic means for detecting submarines/ and methods of their use.

For example, under the "Sea Guard" program the Moffet Field Acoustic Research Center developed a highly effective laser operating in the visible portion of the spectrum and designed for underwater surveillance.

Western specialists assume that in connection with the rapid development of technology there will be a future increase in the importance of fixed submarine detection systems with an operating principle based on a change in the earth's magnetic field in a given area when a submarine passes.

The American Navy command is devoting much attention to the development and improvement of /means and methods of collecting and processing sonar data/ and increasing the efficiency in its use. Existing fixed sonar systems and sonar facilities of surface ships, submarines and coastal patrol aircraft serve as data sources.

The Moffet Field Acoustic Research Center, which has a data processing system based on electronic computers, processes the material.

In the opinion of foreign specialists, centralized processing of sonar data with the help of electronic computers in near-real time permits increasing the effectiveness of the fight against submarines by 50 percent.

Judging from foreign press reports, the United States is developing various data processing systems intended for accommodation aboard surface ships, submarines and coastal patrol aircraft. For example, in 1980 the "Proteus" automated digital underwater situation data processing system is to enter the naval inventory. Its capabilities are double those of existing processing facilities based on analog devices. It is planned to install this system in 240 Orion aircraft, aboard 12 sonar surveillance vessels with towed antennas and aboard 100 frigates and destroyers with towed antennas.

An apparatus for processing sonar signals of a broad band of frequencies for nuclear-powered submarines of the U.S. Navy also has been developed. As the western press notes, it will permit processing signals coming in over 80 channels at a rate up to 160 million signals per second, registering changes in noises of submarines equal to the level of environmental noises, and offering conclusions on their detection.

Great importance is attached to identification of the primary sonar field of surface ships and submarines in the interests of automatic classification of detected targets. A special methodology known as FACT (Fast Asymptotic Coherent Transmission) has been developed for these purposes. It is used to calculate the noise level at the point of emission, determine its direction in the horizontal and vertical planes and classify the source of noise emission.

In the opinion of American military specialists, automation of the process of collecting data obtained by various systems and facilities and its prompt presentation to maneuverable ASW forces acquires exceptionally great importance for centralized processing of sonar data and its evaluation in near-real time.

The problem of automating the collection and processing of data and control of forces at the tactical level is resolved by equipping ships of the main types with the NTDS [Navy Tactical Data System] tactical data-control systems, which support accomplishment of the assigned missions.

At the TVD level the U.S. Navy command plans to resolve this problem by collecting all sonar data at a single shore center and forming uniform data files describing the underwater situation as a whole, its centralized evaluation (by time, location, nature of target and scale of underwater threat) and providing access to this data to interested command echelons.

Sonar data from fixed surveillance systems as well as from on-board detection facilities of surface ships, submarines and coastal patrol aircraft are to be the basis for forming the uniform data file.

It is planned to provide a direct, high-speed exchange of the data through existing and future fixed and satellite communications systems of the U.S. Navy between computers of the shore center and standardized computers of ship formations, and the output of data on the situation in specific areas of ocean TVD's (on request) and for the TVD as a whole.

It is planned to present results of the underwater situation estimate for the theater in the form of data on enemy forces through the U.S. Navy control system being set up in zones. It will include the U.S. Navy's shore-based FCC (Fleet Command Centers) in zones, the ASWCCCS (Antisubmarine Warfare Command and Control Centers System) and the TFCC (Task Fleet Command Centers) automated fleet command centers joined by a centralized ocean reconnaissance and surveillance data system known as OSIS (Ocean Surveillance Information System).

These briefly are the primary directions in the work being done in the U.S. Navy to set up a global underwater surveillance system in sea and ocean TVD's.

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NAVAL TARGET DETECTION: SOVIET REVIEW OF U.S. SYSTEMS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 79 signed to press 10 Dec 79 pp 80-86

[Article by Engr-Capt 2d Rank N. Viktorov: "Capabilities for Detection of Low-Flying Targets in the U.S. Navy"]

[Excerpts] Foreign naval specialists believe that future combat operations at sea will become more complex in connection with the fitting of ships and submarines with missiles. Even today, there is an acute problem in this regard concerning the battle against low-flying antiship missiles (PKR), which are difficult to detect by existing facilities because of their flight and technical performance. Modern PKR's have a transonic flight speed, an insignificant flying altitude (no more than 20 m) in the zone of coverage of ships' detection facilities, and an effective reflective surface of some 0.01 m^2. All this makes them difficult to distinguish against the background of the sea's surface and introduces an element of surprise in delivering strikes against surface ships.

Radars continue to be the primary means of detection, despite the fact that a reduction in flight altitudes of air targets led to a sharp reduction in their detection range. For example, while it is possible to detect planes flying at altitudes of 6,000-10,000 m at ranges of 300-400 km, the PKR's are detected within the limits of the radar horizon. In addition, foreign specialists note that it is difficult to detect a low-flying target against the background of the sea's surface, inasmuch as it represents a constantly changing background object which substantially affects radar range.

The amount of radar signal reflected from the sea's surface also depends on the wind velocity and direction, its duration, the extent of the fetch area, ocean currents, pollution of sea water with petroleum and petroleum products, the effect of distant storms (sea disturbance from them is transmitted over large distances with small losses) and, finally, local weather conditions. With consideration of all these factors, signals reflected from the sea's surface (the so-called "clutter") may be relatively large and in many instances this is what reduces the probability of target detection.

American military specialists who performed a number of studies in the mid-1960's concluded the need for developing specialized radars for detecting low-flying targets. In connection with the fact that the antenna patterns of these radars have a multilobe character as a result of reflections from the sea's surface, detection of a target at maximum range must be done by the lower lobes. To smooth out the multilobe character of the pattern it is recommended using shorter waves and to use methods of frequency or spatial separation for increasing the probability and reliability of detecting a low-flying target, i.e., simultaneously painting the target with pulses of different frequencies or locating two or more antennas of one radar at different heights. It is also advisable to change the kind of wave polarization depending on local weather conditions.

In developing such radars, foreign specialists pay a great deal of attention to protecting receiving devices from passive interference, especially in the tracking modes. To this end circuits for instantaneous automatic gain control (ARU), temporary ARU, small time constant, and pulse blanking are being introduced in the radar receive channels. The most effective are devices for moving target selection (SDTs), the main purpose of which is to reject signals reflected from them. But existing SDTs's with varying design principles (with internal or external coherence, with a compensating or spectral method of interference suppression) reduce radar range by 10-20 percent. This is because sensitivity of receiving devices is somewhat lower because of additional losses in useful signals caused by amplitude clipping on an intermediate frequency and nonoptimal processing of signals in computer devices.

As a result, all aforementioned factors reduce detection range of low-flying targets by 30-40 percent in comparison with maximum ranges of their radar detection given in Table 1 [table not reproduced].

Foreign specialists believe that the optimum flight altitude of PKR's in overcoming a ship's antimissile defense (with consideration of mean statistical data of sea space) should be 15 m above the water's surface. Thus, in their opinion, the practical detection range of PKR's for ships of various types will be 15-23 km.

The AN/SPS-58, the first specialized low-flying target detection radar, was developed by the Hughes firm in the early 1970's and at the present time it has been installed in a majority of American aircraft carriers (Table 2 [table not reproduced]). It operates in the 23-cm wave band, has an interference suppression circuit, an SDTs unit, and a special signal processing circuit which permits detecting PKR's at ranges up to 20 km with high probability. Later the firm produced an improved version of this station, the AN/SPS-65(V) with a lighter antenna which can be hoisted higher on the ship's mast.

At the present time the U.S. Navy is performing preparatory work to develop self-contained radar facilities for detecting low-flying targets which input data into coupled shipboard weapons control systems, as well as integrated target detection facilities which make use of various physical principles for detection and have a direct target designation data input into shipboard weapons control systems.

Shipboard radars with phased antenna arrays (FAR) are considered the most promising. Such radars scan space at high speed and the angular speed of the beam can change as it moves. In addition, these radars are capable of focusing emitted energy in sectors with the highest probability of a target's appearance. Such a station's antenna system allows tracking a large number of targets simultaneously, and the tracking of each target is done by a beam with its own pulse repetition frequency. In the opinion of foreign specialists, an important merit of radars with phased array antennas also is their capability to detect moving targets through a successive analysis of signals reflected from them and received by each beam of the radiation pattern in a specific sector.

Radars with phased array antennas can issue target designations during a mass attack by PKR's. The United States is developing the multifunction AN/SPY-1A radar, which is part of the "Aegis" ZRK [surface-to-air missile system], for ships of large and medium displacement under construction. Its antenna will consist of four fixed FAR's (with a size of 3.65 x 3.65 m), situated in pairs on the ship's bow and stern superstructures and providing a view of the air space under conditions of rolling and pitching motion within the limits of ±30° and ±10° respectively. It is expected that the station will have four independent channels (based on the number of FAR's) operating in the 10-cm wave band (with a power of several megawatts in a pulse), and each channel is to be controlled by an electronic computer. It is not precluded that a simplified version of the station with two FAR's will be developed for ships with medium displacement. According to foreign press data, however, the entry of such radars into the inventory is being delayed for the following reasons: It is difficult to obtain high power in the solid-state elements of the station and provide the necessary speed in collecting and processing data; and it is difficult to develop program support of its operation and the diagnosing of malfunctions in the FAR.

The Hughes firm is developing a simpler but universal station known as the "Flexar" for ships of small displacement in order to implement the advantages of radars with FAR's. The western press reports that it also will provide the opportunity of detecting any air targets simultaneously in a zone (Fig. 1 [figure not reproduced]) and issuing target designations to weapons control systems, but it will have one antenna with FAR rotated mechanically at a constant rate of 60 revolutions per minute. The pulse shape can be changed with each revolution of the antenna, as can the radiation pattern, to provide noise stability in the station.

By developing integrated systems, American naval specialists are attempting to increase the effectiveness of shipboard weapons in combating low-flying targets. For this reason they are supplementing radars included in the weapons control systems with electro-optics: lasers, infrared stations and television stations. This provides a number of advantages, particularly in tracking low-flying targets, although the surrounding situation has a great effect on their operation. Facilities which operate based on various physical principles of operation detect and track targets according to their thermal radiation, receive their infrared or television image, classify them according to the thermal spectrum, and create laser illumination for guiding UR [guided missiles] or projectiles to the target.

The Mk 86 weapons control system in the inventory of nuclear-powered guided missile cruisers of the "California" Class and destroyers of the "Spruance" Class had in its first version two radars for detecting air and surface targets. It was modernized through coupling with a TV station consisting of two remote-controlled television cameras operating during the day and with low levels of illumination, and with a laser rangefinder and thermal vision station for detection, tracking and classification of targets. The Mk 68 and Mk 92 weapons control systems are being modernized in a similar manner.

Detection facilities based on various physical principles of operation were brought together by the American Hughes firm in developing five versions (Mk 20-Mk24) of the IPD-TAS (Improved Point Defense/Target Acquisition System) combination radar-thermal vision system. It is to be used as the primary means of target designation for the "Sea Sparrow" shipboard ZURO [surface-to-air guided-missile weapons] system, and also for other weapons control systems. The Mk 24 is the main version and is to be installed on ships with large displacement. It includes a radar, infrared station, radar identification apparatus and electronic computer. American specialists believe that this allows detecting low-flying targets including PKR's diving on a ship, identifying and classifying them, evaluating the degree of threat, and issuing target designation data (on two or three coordinates) to weapons control systems.

In the passive (main) mode of operation the system detects PKR type targets according to their infrared radiation and radar emissions of their homing heads and it determines the azimuth and angle of sight. Range to the target is measured with the help of the radar (antenna rotation speed of 30 rpm) after identification and classification of the target. The system's radar antenna, which is matched with the antenna of the identification apparatus, and the receiver portion of the infrared station located on the opposite side are installed on a common base stabilized along three axes. The operation of such a system is automated to the maximum. According to forecasts of the manufacturing firm's specialists, other versions are to be used aboard ships with medium and small displacement of NATO country navies because of somewhat poorer specifications.

The U.S. Navy command believes that centralization of the collection and processing of data on the air situation in the ship's zone will permit a substantial increase in her degree of protection against air targets. The foreign press reports the development by the same Hughes firm of the integrated AN/UYK-20, automated on the basis of electronic computers, of the AN/SYS-1 IADT (Integrated Automatic Detection and Tracking) air situation data processing system. It will collect all incoming data, evaluate and process it with a subsequent allocation of target designation data to shipboard weapons systems.

Future plans of the American command are to resolve the problem of a ship force combating a large number of PKR's, for which it is planned to sharply increase the range of detecting PKR's by elevating the radars or their antennas to a high altitude. In the first phase of operations it was decided to use the "Hawkeye" E-2C DRLO [long-range radar spotting aircraft--AWACS] (Fig. 2 [figure not reproduced]). The radar installed in them is capable of detecting cruise missiles at ranges up to 270 km at a flight altitude of 9,000 m. The presence of the ATDS [Airborne Tactical Data System] aboard the aircraft permits displaying and processing current data on 300 air targets simultaneously.

According to foreign press data, the E-3A aircraft in the United States, made on the basis of the civilian Boeing 707-320 aircraft, will be outfitted with radars for long-range detection of air targets and will comprise the AWACS airborne long-range radar detection and control system. Each aircraft in the system is equipped with an onboard radar with FAR, located in a fairing (diameter of 9.1 m) above the fuselage, for detection and tracking of air targets when flying at high altitudes at ranges up to 450 km, and up to 320 km at low altitudes. The aircraft are equipped with automated control posts with a general air situation display screen (2.3 x 2.8 m), projectors for documenting the situation on special film for its playback on request, and electronic computers for data processing. Full deployment of the AWACS system is planned for 1982 on the basis of 34 E-3A aircraft.

Judging from American press reports, the high performance characteristics of dirigibles may make them "sea-control flying ships." It is assumed that a dirigible will be able to have a payload of 400-500 tons, a flight speed of 180-270 km/hr and a range of flight altitudes from 50 to 7,700 m. The presence aboard of means of target search, detection and tracking as well as of data processing apparatus will, in the opinion of foreign military specialists, turn it into a forward post in the warning system of the air and other threat on the part of the enemy.

An important place has been given in recent years to developing systems for continuous air surveillance and relay of data to command posts. High-altitude controllable balloons (Fig. 3 [figure not reproduced]) with power plants being developed in the United States may be used as platforms for radars and other reconnaissance gear. It is planned to accomplish their flights (for a probable duration of 12 months) at altitudes of 21-23 km, where wind velocity is minimal and the range of PKR detection reaches several hundred kilometers.

Specialists in many capitalist countries are attempting to take advantage of the latest achievements in various fields of science and technology for developing fundamentally new means of detecting low-flying targets. Work is being conducted in the field of magnetic location, the physical principles of which permit detection of the magnetic field of a moving target against the background of the earth's magnetic field. In addition, much attention is being given to problems of detecting PKR's based on emissions of the rocket engine's blast in the ultra-long wave band through their superlong propagation in the natural earth-ionosphere waveguide. But the foreign press notes that all these and other methods of detecting low-flying targets still are far from practical application.

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MODERN WARFARE: SOVIET REVIEW OF NATO PRINCIPLES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE In Russian No 1, Jan 80 signed to press 10 Jan 80 pp 13-18

[Article by Lt Gen N. Petrov, Candidate of Military Sciences, and Col B. Andreyev: "Principles of Conducting Modern Warfare (According to the Views of Foreign Military Experts)"]

[Text] The new foreign policy initiative advanced by General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev in Berlin revealed a practicable opportunity to avert the new take-off of the arms race, to proceed with actual disarmament and to safeguard and multiply the fruits of disarmament and peaceful cooperation. The entire world's progressive community appraised highly these new manifestations of the peaceful disposition and free will of the Soviet Union and other countries of socialist cooperation.

There are in the West, however, forces who are trying in every way possible to diminish the significance of the Soviet initiatives and, in defiance of common sense, maintain a course toward increasing the pace of the arms race and preparation for war. They supercharge the atmosphere of fear, intensify military preparations and develop numerous versions of military attack.

In the United States, for example, discussions have recently been revitalized regarding the expediency of inflicting a "preventative strike with strategic nuclear forces on military targets in the Soviet Union under certain conditions." Highly placed U.S. representatives declare that "the entire globe now enters into NATO's sphere of interests." U.S. Secretary of Defense Harold Brown defended the theory of short-lived warfare in his report to Congress in February 1978: "the emphasis on the modern form of short-lived, intensive warfare is not unexpected. Under modern conditions, the lightning victory might make it possible to avoid the risk of escalating military actions up to the point of utilizing nuclear arms."

The idea of inflicting forestalling strikes is very evident in the charters of the major nations of NATO and is reflected in the combat and operational training of their armed forces. West German Minister of Defense Appel, in defending the American plan to deploy hundreds of medium-range missiles in Western Europe, spoke of the "echeloned threat of Europe with the aid of conventional weapons, tactical nuclear weapons and intercontinental missiles."

Everyone, even those who are not military specialists, can easily see that these are not just words. Behind them are concrete plans regarding warfare directed against the USSR and its allies and the expansionist, hegemonist policies of reactionary, imperialist circles.

One of the central areas in military research in the West in recent years has been the development of the principles of conducting modern warfare. Research on this problem is of an applied rather than an abstract nature. At its basis are the following political and military-strategic determinations: the primary enemies of the North Atlantic bloc headed by the United States are the Soviet Union and other countries of socialist cooperation; the main theater of war is Europe; general nuclear and limited warfare (warfare in Europe with the application of conventional and nuclear weapons) may be unleashed against the Warsaw Pact.

The NATO Command considers that the principles for conducting warfare should be in keeping with the state of military affairs in the 1980's and beyond and, in particular, with the development of the weapons of armed combat envisaged in the long-range military program adopted in May 1978. The solution to the problem indicated makes it possible, according to the American and NATO leaders, to seek those means and methods of effectively utilizing troops which will guarantee victory in battle.

The foreign military press examines the principles of conducting warfare as basic rules (attitudes, views) which in the course of battle will guide the commands and headquarters at all levels. It is thought that these principles are closely interrelated and, depending upon the circumstances, may supplement each other or contradict one another. Therefore, the significance of each will vary in accordance with specific conditions. It is stressed, for example, that even the application of tactical nuclear weapons may bring about fundamental changes in the conditions for conducting military operations and, subsequently, may give rise to new principles or else change considerably the substance of the former principles. Thus, a creative approach is necessary.

Western military experts maintain that "if people conduct war, slavishly adhering to the rules, they will lose. With a rational approach these principles may serve as a certain practical standard for checking to see that their judgments are the best."

On the pages of the foreign press one may find various formulations for many principles of warfare. Basically, however, nine are cited: the determination of the goal, the offensive, the massing of manpower and equipment, economy of manpower and equipment, the maneuver, centralized control, security, the element of surprise and simplicity in planning and control.

The determination of the goal is considered to be the first and fundamental principle, since without it all command and headquarters activity loses its meaning. Any military operation must pursue a clearly formulated, decisive and practicable goal. In the general statement of the question, the goal of war, in the end, is the crushing defeat of the enemy's armed forces. On the basis of this fact, the missions of the troops are established, the optimal forces and weapons for their execution are allocated and the plan of action and the nature of leadership are laid out. A correctly set goal contributes to the execution of the mission, while an incorrectly set goal will lead to an unnecessary expenditure of forces and weapons and sometimes to defeat. Thus, each commander is obligated to understand and clearly present his goal and to create a plan of impending action in compliance with it.

In accordance with established views in the U.S. Armed Forces, the offensive is the predominant principle in all forms of conducting combat operations. It is believed that the offensive is necessary for achieving decisive goals and insuring freedom of action. It makes it possible to display initiative, to impose one's will on the enemy, to utilize his weak spots, to establish the time and select the place for conducting combat operations and to have an effective influence on the rapidly changing conditions.

Defense is examined as a forced, temporary measure necessary to create favorable conditions for the offensive or to maintain forces at detached sections of the front. Even on the defensive, however, the commander must seek an opportunity to seize the initiative and achieve a solution to the problems posed to him by carrying out vigorous offensive operations.

The commands of the armed forces of the other NATO-bloc countries also share an official definition of this principle similar to the one adopted in the United States. At the same time, certain foreign military theoreticians cast doubt on the acceptability of this principle in the initial period of war, particularly in Europe where, according to their statements, the enemy surpasses the combined armed forces of NATO in numerical force and the number of conventional weapons and the amount of combat equipment. Speaking in favor of defense in the very beginning of an armed conflict, they cite arguments based mainly on the experience of the 1973 war in the Near East. In their estimation, the prospective systems of conventional weapons introduced to the troops possess such firepower that they increase to a considerable degree the potential to exhaust the enemy's defenses and maintain the combat readiness of one's own troops for subsequent offensive operations. It is believed that modern weapons make it possible for the forces being defended to inflict defeat on the enemy's advancing troops when those troops have a three-to-one superiority in forces and weapons.

Some military experts give preference to defensive operations under conditions of nuclear warfare as well. According to their contention, an advancing enemy becomes more vulnerable to weapons of mass destruction. Because of this, the offensive principle supposedly does not insure the desired success in nuclear war. Offensive operations may get priority mainly in the tactical element. They will be conducted by units (less than batallion strength) in order not to create an advantageous target for a nuclear strike.

Without denying the effectiveness of the new conventional strike weapons, the majority of military theoreticians in the West consider statements on the superiority of defensive operations to be unfounded and believe that the introduction of similar views into practice may lead to irreparable consequences. At the same time, they refer to the experience of limited warfare in the Near East in 1973 which does not provide an impressive basis for a revision of the relationship between offensive and defensive operations established during the Second World War that would favor the latter. Moreover, the indicated Arab-Israeli War also demonstrated the feasibility of effectively utilizing particularly defensive modern weapons in the interests of conducting offensive operations. On the example of the Egyptian troops' use of guided antitank and antiaircraft missiles during the offensive of the Sinai Peninsula, NATO-bloc experts defend the idea that new weapons systems and combat equipment to no lesser degree contribute to increasing the troops' offensive capabilities. Thus, in the opinion of these theoreticians, the concept of the priority of defensive operations is fatal and does not conform to the spirit of modern mobile warfare. The guarantee of success in armed combat is "the skillful combination of tactical defense and extensive offensive operations."

Many experts in the West do not share the point of view of defensive priority in nuclear warfare as well, nor in future warfare with the application of highly accurate conventional weapons possessing great strike capability. It is believed that under these conditions the offensive principle will likewise dominate and that only on the offensive can one destroy the enemy, seize the initiative and guarantee the necessary morale factor in combat and the psychological advantage in war.

The utilization of nuclear and prospective conventional weapons somewhat amends the principle of the offensive. For example, in the opinion of U.S. military experts, the role of the initial offensive operations will increase particularly under modern conditions. It is pointed out in official manuals that the previous American plans for the mobilization and reinforcement of forces planned for extended periods of time in the theater of military operations are unrealistic, considering the complex strategic situation in Europe at present. The timely shipment of weapons and personnel here cannot compensate for initial defeats. The task has now been put before the armed forces of the NATO bloc--make sure to win the first operations (battles) in the war's initial period.

The American viewpoint on the dominant role of the offensive is wholly supported by the Bundeswehr Command. The Bundeswehr Command bases its belief on the fact that in modern warfare it is necessary to "win the first battle" by inflicting considerable losses on the enemy in the first days or even hours of the war along "the most advanced lines." At the same time it is particularly emphasized that the "first battle" is not a "brief war" but a series of extended operations.

Defending the principle of the offensive in war and the necessity of achieving victory in the first battle, Western experts also recognize that it is very important to be prepared for the second and subsequent battles. Thus, the journal MILITARY REVIEW replies to the question, "Are we to assume that victory in the first battle means that a second battle will not follow?" with the answer: "At this time it cannot be put simply. The enemy is well prepared to maintain the capability for subsequent battles even in the face of considerable initial losses. Thus, it is hardly likely that the first victory will make it possible to avoid subsequent military operations. Consequently, one must be prepared to wage war through many battles."

As is emphasized in the foreign press, this theoretical conclusion is realized in practice by the U.S. Command through the deployment and maintenance of modern, balanced forces in the continental and shore regions of the theater of military operations. These forces are prepared to conduct operations along a broad front over a long period of time without significant initial reinforcement. They also maintain in constant readiness powerful industrial, rear and mobilization bases capable of supplying the forces mentioned.

The essence of the principle of massing manpower and equipment, as it is defined in official U.S. Army manuals, consists in concentrating superior forces at the critical moment in particularly important sections of the front as a means of achieving success. The realization of this principle involves insuring, in the first place, the high degree of mobility and the ability of the formations and units to concentrate quickly in the designated areas. Guided by this requirement and considering the other principles of warfare, one may achieve considerable combat superiority in a decisive direction with a numerically smaller force.

The principle of economy of manpower and equipment in the classical sense means reducing forces in auxiliary directions with the aim of guaranteeing superiority in a decisive location. In this case, minimal manpower and equipment are employed in certain areas. The primary effort is concentrated in the main direction. In particular, the American manuals recommend concentrating the primary offensive effort in narrow regions, creating a 6:1 ratio of forces. The ratio on the defensive is 1:3.

Insuring superiority in the main directions, according to American military experts, requires a certain risk and demands the skill to conduct simultaneously various types of military operations: the offensive in the main direction and defensive or even retreat operations in secondary regions.

It is believed that the massing and economy of manpower and equipment is acceptable in both conventional and nuclear warfare.

The maneuver is an essential component of combat strength. It contributes to developing success, insuring freedom of action and reducing the vulnerability of one's troops. Its primary goal is the concentration (or dispersal) of one's manpower and equipment in such a way as to put the enemy at a disadvantage and in this way achieve decisive success. There is an acute controversy on the pages of the military press in NATO countries surrounding the question of the essence and intent of the maneuver in modern warfare. Without denying the significance of this principle, some military theoreticians believe that both in offensive and defensive operations the maneuver should be carried out mainly to bring firepower to bear on the enemy and exhaust his forces. During the maneuver, firepower is concentrated first of all to physically destroy the enemy's manpower.

Other experts, relying on the experience of the Second World War and local conflicts in the last decade, interpret the maneuver as firing and moving, with the priority of the former being unfounded in light of a review of history and the essence of the problem. In their opinion, the significance that the maneuver found during the Second World War, particularly in battle with the enemy's numerically superior forces, has not decreased. The validity of this "combat device" (under conditions in which there is a sharp increase in troop mobility and the long-range capabilities and effectiveness of weapons) has now increased considerably. The maneuver is seen as the ultimate operational strategic goal. It is directed toward the destruction of individual forces and the creation of an unexpected and unfavorable operational environment for the enemy. In this case, firepower should be used basically for insuring such a maneuver.

In order to reaffirm their own position, some authors refer to the experience of the 1973 war in the Near East which, in their opinion, taught a lesson about the skillful combination of mobility, firepower and strike power of troops for the purpose of creating a situation for the enemy that has irreparable consequences. The advance of the armored and mechanized Israeli troops and the overcoming of the Suez Canal is, as they maintain, a classic example of the application of the maneuver. With its help the Israelis succeeded in catching the Egyptian troops unawares, in upsetting the operational plans of the enemy's high command and in practically undermining the enemy's will to resist further.

The maneuver as a "combat device," as is emphasized in the American military press, will dominate in modern warfare with the application of both nuclear and conventional weapons. Thus, the mobile nature of warfare is predetermined as military operations expand simultaneously along a broad front and to a great depth in the absence of a stable front line.

The principle of centralized control, as the U.S. and NATO military experts believe, is necessary to consolidate the efforts of all types of armed forces and branches of the service by organizing the efficient coordination and cooperation of their actions in order to achieve the ultimate goal of warfare. Coordination provides for the joint operations of command organs of various types of armed forces whose missions are determined by a higher command. In order to accomplish this coordination at a certain stage, joint command organs may be created. Centralized control is accomplished within the framework of a single combined-arms command, that is, by concentrating absolute power in the hands of one command authority.

In the evaluation of Western theoreticians, the principle of security consists of maintaining the combat strength of the armed forces and includes: concealment of operations in order to prevent sudden enemy attack and sabotage; the defense of military installations; the massing of troops and equipment; safeguarding State and military secrets; and conducting counterintelligence operations for the purpose of hindering or prohibiting the enemy's intelligence operations. Disinformation, diversions, demonstration operations and the guarantee of concealment for one's own actions are also related to measures for insuring security. Units and subunits are obliged to observe a communications routine, maintain radar deception, avoid repetitious practices, maintain the uninterrupted command of the troops as an element of security, etc.

However, the given principle does not assume a display of extreme caution nor does it exclude reasonable risk. The NATO-bloc Command bases this on the fact that risk in war is unavoidable.

With modern combat weapons, the element of surprise, in the opinion of Western experts, finds predominant significance. It is believed that because of it, success may be achieved independently of the degree of effort expended.

Surprise is achieved by striking the enemy at that place and at that moment where it is not expected. It is stressed in the foreign military press that it is not necessary to catch the enemy unawares. The main thing is that the enemy determines too late the true intentions of the other side.

The factors that insure surprise include: swiftness of action, the utilization of manpower and equipment unknown to the enemy, effective intelligence, various methods of conducting tactical operations and a combination of measures provided for by the principle of surprise.

The principle of simplicity in planning and control, as considered by Western theoreticians, makes a considerable contribution to the successful conduction of modern operations that are complex by nature. A simple, understandable plan and clear-cut, literate orders and instructions reduce the possibility of misunderstanding and incorrect interpretation. Simplicity and clarity are not an end in themselves but a means to insure unity of effort and the most effective operations. Conforming to the circumstances, the commander is obliged to display flexibility and adopt measures that are simple in design and lend themselves to execution.

In order to insure efficient planning and control in nuclear warfare, it is necessary to consider the necessity of coordinating the maneuver with fire strikes inflicted by decision of higher headquarters. One must also consider the complex system of supplying nuclear ammunition and the permission for its use.

Such are the basic principles of conducting warfare, in the opinion of foreign military theoreticians. These principles have been officially adopted in the armed forces of the United States and the other NATO countries. They correspond fully to the aggressive spirit of the modern U.S. military doctrine and NATO's coalition military strategy. Their cornerstone is becoming the requirement that troops be ready not for "flexible reaction" to enemy actions but for vigorous forestalling actions from the very outset of armed conflict.

The trend in the development of U.S. and NATO military theory as well as the military preparations being carried out on a bloc-wide scale are subordinate to one goal--preparation for war against the countries of socialist cooperation and the achievement of military superiority over them.

This makes it incumbent upon the Armed Forces of the Soviet Union to keep a vigilant watch over the intrigues of the militarists and to be constantly ready along with the soldiers of the fraternal socialist nations to safely defend the revolutionary achievements of the workers.
[224-9512]

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CHEMICAL WEAPONS: SOVIET COMMENTS ON NATO VIEWS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 80 signed to press 10 Jan 80 pp 27-29

[Article by Col G. Alksnis: "Chemical Warfare (According to the Views of the Bundeswehr Ground Forces Command)"]

[Text] Hiding behind the myth of the "Soviet military threat," reactionary circles within NATO are building up an arsenal of every kind of weapon, including chemical weapons, at a time when peacefully disposed States, spearheaded by the Soviet Union and the other countries of socialist cooperation, are stepping up their campaign of arms limitation and reduction.

Despite the Geneva protocol of 1925, which forbade chemical warfare, the military and political leadership of the FRG is developing theories to justify the production, accumulation and modernization of chemical weapons as well as the solution to problems of their utilization.

It is appropriate to mention here that it was the German Army that first conducted a gas attack against the French troops in 1915. At the present time the Bundeswehr Command, relying on the development of the chemical industry in West Germany, is carrying out extensive measures to train its troops in the application of chemical weapons and the defenses against them (in this case, the experience of the U.S. Army is being taken into account).

The national and NATO conceptions of the nature of modern warfare form the basis of the views of the Bundeswehr ground forces command in regard to the use of chemical weapons. As is noted in the Western press, the country's military and political leadership is expending great efforts in order to achieve access to weapons of mass destruction in peacetime and to possess an advantage over West Germany's own European allies in NATO in the matter of the application of such weapons in future warfare. They base their demands on the fact that the FRG immediately borders the socialist States and, among the European member nations of NATO, will bear the brunt of the warfare. Foreign military experts assume that it will be possible in the future to conduct combat operations between the coalition armies of the two political systems with nuclear arms or with conventional arms alone.

The foreign military literature emphasizes that it is expedient to use chemical weapons in both cases. In addition, according to the views of the West German Command, particular attention is being given to surprise, the rational selection of the type of toxic agent, the means of delivery and the methods of using it against the main body of the enemy in conjunction with other types of weapons. Attention is also being directed toward a rigorous consideration of weather conditions and terrain.

It is believed that on the offensive it is expedient to use a quick-acting toxic agent such as BZ, which disturbs the physical and psychological condition of soldiers on the battlefield, or irritant toxic agents, which act on the mucous membranes of the eyes and the upper respiratory tract. In the given case, it is recommended that one carefully evaluate the location, condition and nature of action of one's own troops and the troops of the enemy as well as the consequences of carrying out the mission. As far as stable toxic agents are concerned, they may be utilized to cover the formations' flanks and to isolate the approach regions, the areas where the reserves are concentrated and the enemy's lines of advance, in order to create favorable conditions for the subsequent defeat of the enemy's troops with all weapons at hand. On this basis, the plans for chemical warfare are strictly centralized and are usually carried out by corps headquarters and are coordinated with a higher command.

The use of stable toxic agents (VX, zarine, zoman, etc.) is specified, as a rule, when defending against an advancing enemy. The stable toxic agents retain their debilitating properties on location over a long period of time. The time is determined by the duration of the measures taken to stem the advance on long approaches as well as on the edge of one's own defenses. Thus, the depth and scale of the contaminated regions may be considerable. It is believed that the basic missions for the application of chemical warfare in defense may be the following: to prevent the approach of reserves and the transport of materiel; to inflict losses in enemy manpower on the offensive in regions of concentration and in forming-up areas for the advance; and to create chemical minefields with the aid of chemical mines (installed in a security zone) in order to stop a maneuver, disorganize command of the troops, reinforce engineer-constructed obstacles, create favorable conditions for cutting off the enemy's advances and to create an organized breach in his defenses.

According to the experience of a number of exercises, chemical weapons were "adopted" from the very beginning of combat operations in combination with conventional weapons. This, according to information in the West German press, insured sufficient "destruction" of the advancing troops, a reduction in their combat capability and a slow-down in the rate of advance.

As the foreign military press reports, there is in the Bundeswehr ground forces a sufficiently extensive arsenal of weapons for delivering toxic agents. The agents are capable of striking people and animals and of contaminating the countryside, including reservoirs and rivers. The greatest significance is attached to volley-fire rocket systems (RSZO), which make it possible to carry out chemical attack suddenly and on a large scale. For this purpose, the 110-mm, 36-barrel, self-propelled LARS volley-fire rocket system may be utilized. It has a maximum range of 15 km. A similar MARS system is being developed which has a range of 60 km. The toxic agents may be delivered in the warheads of the guided Lance and the unguided Honest John missiles, the ranges of which, respectively, attain 120 and 37 km.

Along with rocket systems, the ground forces have adopted 155 and 203.2-mm howitzers as well as 120-mm mortars. These may be used to deliver chemical ammunition filled with various toxic agents. In a motorized infantry division alone there are more than 120 rounds of chemical ammunition. Moreover, chemical mines and ground bombs, smoke pots, hand grenades and toxic agent sprayers may be employed in the tactical depth.

An important position in chemical warfare is assigned to the aircraft of tactical aviation, from which are suspended airborne spraying devices and munitions dispensers and bombs containing toxic agents. With the help of these weapons, a considerable surface area of both the enemy's tactical and operational depths may be contaminated in the interests of the ground forces.

The ground forces command thoroughly appraises not only the application of chemical weapons but also the injurious effect of toxic agents on both belligerents.

In the West German manuals and directives it is noted that the injurious effect of chemical weapons is usually represented by the number (percentage) of personnel in the unit who have been taken out of action. The average norm is 30 percent of the unit personnel slightly injured. The unit loses its combat capability for several days. The effect of the damage depends upon the degree of suddenness with which the chemical weapons are used, the correct selection of the means and methods of utilization, the type of toxic agent, the speed of creating combat concentrations in a given region, the degree to which personnel, equipment and installations are protected as well as upon the weather conditions and terrain.

An important task carried out by the ground forces and the Bundeswehr at large is considered to be the organization and guarantee of reliable protection for their own troops and installations from contamination by the enemy's toxic agents. As is noted in foreign military literature, measures taken to protect troops from chemical weapons are a component part of the problem of protecting troops from weapons of mass destruction. In order to carry out these measures, each army corps has an ABC (Atomic, Biological and Chemical) battalion, while each division has an ABC company. These units are intended for the organization of antiatomic, antibiological, and antichemical protection for personnel, weapons and combat equipment in the units. As is noted in the West German manuals, the ABC company includes a command section, three platoons (chemical, bacteriological and radiation reconnaissance; special treatment; supply) and has facilities to conduct reconnaissance, decontamination and degassing.

Training in chemical warfare defense is carried out in the course of the units' dailt combat training. The results of this training are consolidated in exercises conducted according to national plans within the framework of NATO and under conditions as close as possible to combat conditions. A set of orderly instructions for training has been developed in the Bundeswehr. They cite conditions for solving problems of defense, possible errors and the methods of eliminating them.

The attitudes examined regarding the use of chemical weapons and the protection of FRG ground forces from them testify to the fact that the Bundeswehr Command in its revanchist aspirations against the Soviet Union and the other socialist States is counting on using this barbaric weapon as well to destroy people.
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AUTOMATED CONTROL SYSTEMS: SOVIET REVIEW OF U.S. DEVELOPMENTS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 80 signed to press 10 Jan 80 pp 41-46

[Article by Engr-Lt Col V. Vladislavskiy, Candidate of Military Sciences: "Automated Control Systems for the U.S. Army"]

[Text] The U.S. ground forces command is expending considerable efforts so that the operational command levels may provide rapid, reliable, uninterrupted and flexible control over their troops both in peacetime and in war. In addition, a large role is being assigned to automating the control of combat-ready forces. The following conditions form the basis for this role: the introduction of computer technology into all command organs, first of all at the division level; the full automation of control systems for weapons and equipment; and the presence of developed systems of communications that make it possible to transmit data efficiently and reliably.

The conditions indicated find their practical embodiment in automated control systems (ASU's) which are used to automate the operations of command posts and command organs associated with the combat support of the troops. American experts believe that automated control systems should: meet the requirements for high reliability and flexibility; insure the efficient collection, processing, storage and distribution between various command levels of a great volume of information about the enemy and his troops; guarantee an operational interface with the systems of various levels of ground forces command as well as with those of the commands of other services of armed forces and of higher command; and possess a high degree of security and protection from enemy radioelectronic warfare.

In its plan to employ automated control systems among the troops, the American Command is devoting a great deal of attention to developing new principles for their use and the modernization of currently adopted systems for controlling combat operations, field and antiaircraft artillery fire and logistic support (MTO). It is also giving great consideration to the creation of new, up-to-date systems and their components. In the development of principles for the use of automated control systems, great significance is attached to organizing the coordination of automated systems within a single level of command as well as with systems of upper and lower levels.

At the beginning of the 1970's new programs were adopted in the United States that were directed at automating the combat operations processes of the ground forces: ARTADS (Army Tactical Data Systems), MASSTER (Modern Army Selected Systems Test Evaluation Review) and IBCS (Integrated Battlefield Control System). All of these provide for further improving existing automated control systems and for creating new ones. In particular, the computers of the automated ground forces control system of the DACCS (Department of the Army Command and Control System) were replaced with large series-6000 general-purpose computers with peripheral equipment from Honeywell. These guarantee the input and processing at high speed (about 1.5 million operations per second) of the great volume of information arriving both from subordinate units and from coordinating headquarters or higher.

The automated control systems of antiaircraft missile complexes are being modernized (at the level of replacing individual modules). These systems provide for the acquisition, identification and tracking of aerial targets, the display of data on the air situation and the combat readiness of antiaircraft missile batteries, the determination of the level of threat, the allocation of targets and the control of antiaircraft batteries.

According to information in the foreign press, the U.S. Army Command is devoting considerable attention to improving automated control systems for logistic support [ASU MTO]. It believes that the most important trends in increasing the efficiency of logistic support organization are the simplification of the troop supply system at all levels and in all possible ways and the extensive introduction of automated equipment. At the same time, problems of both the informational and functional compatability of computers must be solved. The first will be achieved by means of using standard equipment and introducing common standard accounting and ordering forms. The second will be solved through a clear-cut delimitation of the tasks carried out by the automated control system. These tasks may vary in accordance with changes in the overall concept of logistic support.

Automated control systems for logistic support are presently being used in ground forces at all levels--from directing the Department of the Army and base depots on the continent to the control of logistic supply units. Included among the problems they are to solve are the accounting and distribution of logistic support forces, control over maintenance and repair (in troop units and subunits) and the transport of materiel.

Measures are constantly being implemented in the United States to create more improved automated control systems for the ground forces which will satisfy the requirements not only of today but of the next decade as well. For example, much work is being done on creating the TOS [Tactical Operations System]. This is an automated control system for combat operations, expected to be adopted in the 1980's. The development of this system was brought about by the fact that the usual methods of collecting, processing and storing operational information do not insure the timely adoption of sound decisions and the delivery of orders and instructions to subordinate elements.

The foreign experts note that a certain gap has formed between the rapid development of weapons, the increased maneuverability and striking power of the forces and the methods for controlling them. The research that had been conducted showed that, because of the lack of time on the part of commanders and headquarters to adopt sound decisions, orders and instructions for conducting combat operations were based on intelligence data comprising only about 30 percent of the information available, and this data itself was far from being optimum.

Plans are being made to deploy the TOS automated control system primarily in divisions in order to carry out the following tasks: the collection, storage and on-line processing of data on one's own troops and those of the enemy (disposition, numerical strength, combat readiness, the number of weapons, etc.); the analysis of targets; operational planning; control of tactical operations; the execution of calculations associated with predicting radioactive fallout (time, place and amount) and with evaluating the damage and determining the areas contaminated by a nuclear blast; and graphic display of information and the delivery of the commander's decisions to his subordinates. In all, this system provides for the execution of 25 operational and tactical tasks encompassing almost all of the commander's most important battlefield activities. Two and a half to three hours are required to develop recommendations for making decisions on conducting combat operations.

As is reported in the foreign press, the TACFIRE* [Tactical Fire Direction System] automated field artillery fire control system is in the completion stage. This system was supposed to be adopted at the end of the 1970's. According to the evaluation of Western experts, this system will insure the processing of data on 1000 targets in 7 seconds (done manually, it would take 6 minutes), the preliminary analysis of targets for 10 fire units in 10 seconds (instead of 15 minutes) and fire planning for 35 targets in 28 seconds (previously this required the work of all the personnel in the division's fire-direction center for 4 hours). It takes 5 minutes to deploy the system when its elements are mounted on mobile equipment and 30 minutes when they are set up on the ground. The system includes apparatus for processing and displaying data as well as portable input-output data equipment.

The heart of the TACFIRE system is a high-speed general purpose AN/GYK-12 computer whose software includes an operational system (to control the operation of the computer and its peripheral equipment) and 24 operational programs (for carrying out tactical assignments). The basic programs are the following: overall analysis of data on the enemy, processing of information on nuclear targets, fire planning with the use of nuclear, chemical and conventional charges, target reconnaissance, calculation of initial firing data, processing of weather information and surveying data, the solution of technical control problems and storage of data on the ammunition on hand.

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*For the TACFIRE system see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE No 4, 1975 pp 33-39

Work is being conducted in the United States on the creation of a compact automatic fire control system for field artillery battalions that has been given the name BLC (Battery Level Computer). It is being developed by the firms of Norden (United States) and Marconi (Great Britain). This automated control system will replace the currently adopted ground forces' FADAC [Field Artillery Digital Automatic Computer] system in the beginning of the 1980's. The first 10 complete units underwent preliminary testing at the end of 1977.

The BLC system insures the delivery of initial firing data for 12 guns. In conjunction with the TACFIRE automated control system it will make it possible to plan fire also.

The system includes a computer, gun display units and equipment for the transmission of information. The computer is the main component and is located at the battery command post. It insures rapid computation of all calculations associated with preparing initial fire data. In order to store the initial and auxiliary information as well as to retain the results of intermediate computations, an internal memory unit is employed. It has a capacity of 32K (which may be increased to 48K) 24-bit words. The results of the calculations are represented on a cathode-ray tube [CRT] data display unit which provides for the simultaneous transmission of up to 1728 alphanumeric symbols (24 lines of 72 symbols each).

The computer operates on a program entered on a magnetic tape in one minute. Control over the computer and monitoring of its operation are accomplished with the aid of a keyboard, switches and displays. The computer has a built-in monitor circuit that makes it possible to show up and eliminate troubles. The computer's mean time between failures is 1200 h. The average time needed to eliminate a fault is 30 min. The computer is built as an individual module with dimensions of 46x43x61 cm and a weight of 41 kg. Power supply may be accomplished from both AC and DC power sources. Power requirement is 227 W.

A gun display unit is installed near each gun. The set includes the commander's query-reply unit and two control units. The former is used to confirm commands and any other data connected with the execution of combat missions, while the two others are used to receive and carry out the gun's commands for azimuth and angle of elevation.

The apparatus for transmitting information insures communications between the command post and the battery's guns and makes it possible to transmit data by radio and by land line. It consists of regular communications gear and KY-57 and KG-31 encoders controlled with the help of special microprocessor devices.

According to data in the American press, work is being conducted on the Tri-Tac(?) program. This system provides for the creation of an automated communications system for use at the tactical operational level. On an order from the U.S. Department of the Army, the firm of Sylvania has already produced nine examples of the AN/TTC-39 switching unit, which is installed in standard S-280 equipment shelters. The shelters may be transported by helicopter or on the 2.5-ton truck. Each switching unit is made of rigid matrices and provides for the connection of 300 or 600 subscribers (depending upon the wiring diagram). Two switching units are undergoing testing at the present time.

The JTIDS (Joint Tactical Information Distribution System) is also being built. It will be the basic communications subsystem of the automated control system for troops at the tactical level. It will have high-speed multichannel lines of communications for the transmission of data. These lines will be equipped with secure-communications apparatus and devices to insure operation when the enemy employs radioelectronic warfare measures. At the present time the American firms of IBM, ITT, Rockwell and Singer are conducting work on creating terminal equipment for this system, which could be carried and installed on small unmanned aircraft and missiles. It is expected that the test model of one of these units will be ready by 1984.

As is noted in the foreign press, the Americans continue to give consideration to creating new automated control systems which utilize the latest technological achievements. This is being done despite the great number of various automated systems now employed in the U.S. ground forces' logistic service. For example, the Hughes firm has developed the Technicians Maintenance Information System (TMIS) to service weapons and combat equipment. It includes a data display unit with keyboard and a floppy disk microprocessor memory unit. The use of these disks and a special programming language makes it possible to store and process a great volume of information concerning, for example, the procedure for servicing weapons and combat equipment, possible troubles, etc.

At the beginning of 1979, a $40.7 million contract was signed with Texas Instruments for the development of the mobile automated TIPI/MAGIS [Tactical Information Processing and Interpretation/Marine Air Ground Intelligence System] to process reconnaissance data in the interests of all services of the armed forces. It is intended to analyze aerial photographs and prepare reconnaissance data. The first 20 examples will enter service in August 1980.

In creating these new systems, experts are giving much consideration to their individual components. For example, the firm of (Kolm) has developed a number of computers for automated control systems. In particular, the ground forces have adopted the AN/UYK-19 computer. It is of modular design, which makes it possible to house its individual components in various parts of the portable facility as well as to conduct on-line monitoring of the operation of the units and their repair.

According to data in the foreign press, the AN/UYK-19 computer is general-purpose and may be used in systems of various designation. It is made up of the following basic units: a processor, an internal memory unit, a data display unit, a coupling unit and a printer.

The processor makes calculations with 16-bit words and has an internal memory unit with a 64K word capacity. Addition operations are done in 1.2 µs. The mean time between failures is 3200 hours and repair time is 12 minutes. It may operate in a multiprogram mode and has a secure memory circuit which makes it possible to avoid unauthorized access to stored data. Its dimensions are 19.4x33.3x40.8 cm and its weight is 26 kg. Power supply is accomplished from an AC circuit of 110-220 V/47-400 Hz. The maximum power requirement is 300 W.

The internal memory unit is intended for the storage of working programs and various data. It has a volume of 65,536 words. The data display unit presents the information necessary for conducting combat operations on a cathode-ray tube (against a background of terrain maps).

The coupling unit provides for the transmission of data in numerical form at a speed of 600-32,000 bits/s as well as telephone conversations on 16-channel communications. The printer is used when it is necessary to print the data on paper for their further analysis. Its speed of operation is 1200 lines/min.

American experts believe that multiprocessor computers will be widely used in the 1980's. It is proposed that these computers make use of multiprogram control units, read-only memory and specially programmed units that make it possible to increase considerably the equipment's high-speed operation and solve certain problems associated with the programming. It is expected that by 1985 the high-speed operation of such computers will attain 44 to 28 million [as published] operations per second and the mean time between failures will reach 15,000 hours.
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AIR POWER: SOVIET REVIEW OF NATO CAPABILITIES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 80 signed to press 10 Jan 80 pp 51-58

[Article by Col (Res) G. Osipov, Assistant Professor and Candidate of Military Sciences: "The Build-up of Strength in the Air Forces of the NATO Countries"]

[Text] The aggressive circles in the United States and other member nations of the NATO bloc continue to build up the strength of their forces, at the same time attaching great significance to increasing the combat efficiency and combat readiness of their air forces. The following measures are being implemented for this purpose: the reequipping of aviation units with qualitatively better aircraft; the modernization of the aviation equipment that has already been adopted; the improvement of tactics for conducting military operations and the methods of combat training; the improvement of control systems and logistic support; an increase in the mobility of aviation, etc. Cited below is some information about the progress that has been made in realizing these measures, based on data published in the foreign press.

The reequipping of the air forces with new aircraft is being accomplished in practically all NATO countries.

A great many up-to-date aircraft are being purchased for the U.S. Air Force Tactical Air Command, in particular, 729 F-15 and 1,388 F-16 tactical fighter aircraft as well as tactical aircraft specially equipped to conduct radioelectronic warfare (of these, 40 are EF-111A's and 116 are F-4G's). Many of these aircraft have already been delivered to their units. The United States intends to reequip 89 squadrons in all.

The Air Force of the FRG plans to obtain 322 Tornado tactical fighters (not counting two test models) and 175 Alpha Jet aircraft and use them to replace the outdated F-104, F-4 and G.91 aircraft.[1]

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[1] For more details see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE No 6, 1978 pp 54-58

The royal Air Force, having just completed reequipping its air units with the Jaguar fighter-bomber, has begun reequipping its bomber squadrons with multirole Tornado G.1 aircraft and is conducting work on creating a Tornado F.2 fighter-interceptor. The Royal Air Force plans to purchase 385 such aircraft in all, 220 of the first version and 165 of the second.

The Air Forces of Belgium, Norway, Denmark and the Netherlands have begun reequipping their air units with the latest tactical fighter, the F-16 (358 purchased). The Italian Air Force Command plans to obtain 100 Tornado aircraft.

Thus, as is noted in the foreign press, in accordance with just the basic programs for reequipping their air forces, the NATO countries will obtain more than 4,200 new combat aircraft in the next five to six years.

Simultaneously with this, work is being conducted in the United States on creating new combat aircraft, particularly a next-generation tactical fighter and a highly maneuverable fighter-interceptor, in order to expand the combat capabilities of their own Air Force. Their European allies are studying possible designs for a future combat aircraft, but as yet they are unable to make their requirements agree.

The modernization of aircraft equipment that has already been adopted is being carried out according to numerous programs.

The American experts plan to increase the F-15's ordnance load and fuel reserve, improve the software for the onboard radar and other systems and install an inertial navigation system on the A-10 attack aircraft. They will also install on the A-10 a forward-looking infrared [FLIR] system and individual electronic defense weapons (automatic chaff and IR decoy flare dispensers). They plan to equip the F-111 fighter-bomber with an automatic system for extreme low-level flight, with the Pave Tack suspended weapons-control pod and with up-to-date radioelectronic warfare devices as well as arm the F-111 with the Maverick guided missile. Plans are being made to complete the installation of a new radioelectronic reconnaissance system in the RF-4C reconnaissance aircraft. This system operates in conjunction with the side-looking airborne radar [SLAR] and should, in the opinion of the American experts, increase considerably its capacity for carrying out reconnaissance missions under adverse weather conditions.

Various projects are under way for modernizing the onboard equipment of B-52 bombers and other military aircraft. The designs of the C-5, C-141 and C-130 cargo aircraft are being improved.

Plans are being made in the FRG to improve the onboard equipment of the F-4F fighter aircraft. This will make it possible to increase the precision of air navigation and will provide the capability of using the newest types of missiles and bombs.

The Italian Air Force plans to modernize the F-104 by fitting it with an up-to-date radar unit and equipping it with Sidewinder (the latest version) and Aspide missiles. They also plan to develop by 1983-1984 a new close air support aircraft (the AM-X program) to replace the obsolete G.91.

The NATO countries are also devoting a great deal of attention to equipping combat aircraft with new onboard ordnance (aerial bombs, missiles, rockets and aerial cannons).

For example, the three leading countries of this aggressive bloc--the United States, Great Britain and the FRG--are working on new weapons systems which can destroy armored ground targets over a great area. In the United States, in particular, they are developing guided cluster bombs. These may be armed as antitank bombs and mines and can destroy the enemy's combat vehicles over a considerable area.

The MW-1 munitions dispenser (weight of about 4600 kg) has been built in the FRG to equip Tornado and F-4 aircraft. It scatters hollow-charge, fragmentation and other types of bombs and mines capable of destroying tanks, APC's, aircraft and other targets over an area of 500x2500 m. Similar work is also being conducted in Great Britain.

In order to increase the strike accuracy on small-scale targets, plans are being made to adopt the Maverick missile with laser and infrared seekers. In addition, the PLSS (Precision Location Strike System) is being developed in the United States. This system is intended to determine the coordinates of targets--electronic emitters--and provide radionavigational commands for strike aircraft and guided weapons onto those targets.

Development of the tactics of combat operations is being accomplished by refining the "doctrines" (views on the use of aviation) and instructions on the organization of tactical operations, the redistribution of missions among the fighter units and the search for and development of new tactical methods.

In accordance with the first trend, common attitudes about the operations of tactical aviation in modern warfare were adopted by NATO in 1976.[2] In order to improve the organization of the joint tactical operations of the air and ground forces, commands have been created in the United States for the tactical employment of aviation and ground forces and for the programs of aviation and ground forces. The first is responsible for developing concepts of tactical employment, tactics of operations and instructions for joint tactical operations. The second is entrusted with the task of introducing these ideas and recommendations into practice in the units' combat training.

The headquarters for the tactical employment of aviation and ground forces, as the Commander of the U.S. Air Force Tactical Air Command announced, is presently working on the basic principles of operation of: reconnaissance and observation, the coordination of aviation and ground forces, close air support, isolation of the tactical operations area, suppression of the enemy's air defense system, control of air traffic over the tactical operations area, radioelectronic warfare, airbase defense, etc. In addition, it is responsible for training the forward air controllers. Its suggestions are being tested in exercises. For example, it was reported in the foreign press that the tactics for A-10A attack aircraft operations against tanks in coordination with combat (AH-1) and reconnaissance (OH-5) helicopters and artillery were worked out in special exercises at the end of 1978. In the opinion of American experts, these exercises showed that, in spite of some difficulties, the effectiveness of the strikes against tanks with this kind of cooperation increases by a factor of 3-4, while the losses of A-10's and helicopters decreased by 50 percent. The military leaders of the NATO countries redistributed combat missions among their units in light of certain changes in the composition of their air forces and in the views toward their employment under the conditions in Western Europe. Take the case of the F-111 fighter-bombers, in particular. Whereas previously units of American F-111's were totally commited to the mission of isolating the tactical operations areas in the Central European theater of operations, they are now also entrusted with rendering close air support to the ground forces. Up to 50 percent of the air sorties may be allocated to carrying out this support. Units of F-4 tactical fighters are directed in operations against both air and ground targets. It is noted in the foreign press that considerably greater numbers of tactical aviation forces are being allocated for strikes on the enemy's advancing armored troops than in the past.

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[2] For more details see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE No 1, 1978 pp 49-53

To insure the execution of the missions under complex combat conditions and in bad weather in the Central European theater of operations, the air forces of the NATO member nations are developing operations for air forces with practically destroyed commands. They have worked out and are developing a new method of combat operations which will increase the effectiveness of air strikes against advancing tanks. It consists of tactical fighters inflicting strikes on a target in accordance with data received from a specially chosen reconnaissance aircraft. In this case, the crew of the reconnaissance aircraft is entrusted with the responsibility of: discovering and determining the coordinates of the enemy's armored columns; meeting the strike group and directing it to the target; controlling the aircraft during strikes on the target; and determining the degree of its destruction. In another version, the crew of the reconnaissance aircraft only informs the tactical aircraft strike group of the coordinates of the tank columns detected and monitors the results of their strikes.

The foreign military experts believe that such a tactic should reduce the losses of strike aircraft to air defense weapons, since the strike aircraft always remain at extremely low altitudes until making the attack run, when they increase altitude only immediately before making the strike. This tactic should also increase the efficiency, accuracy and effectiveness of the strikes.

Fighter-interceptor crews of NATO's Combined Air Forces are working to develop long-range all-weather interception of single aerial targets and repulsion of the enemy's massed air attacks with the application of radar control systems for weapons and guided missiles. They train in executing these missions from ground alert status and in the air.

According to information published in the foreign press, the fighters of the NATO countries, including the F-15 and F-16, do not possess reliable long-range airborne target identification systems and are forced either to use information from ground command posts or else approach the targets. Moreover, after launching its missiles the aircraft must direct them to the target. All of this leads to increasing the probability of a retaliatory strike. Therefore, NATO experts are conducting an intensive search for tactical methods and new types of weapons which will make it possible to compensate for these shortcomings. One such solution of the U.S. Air Force Command and its bloc allies can be seen in the reequipping of fighters with missiles that do not require guidance after launch.

According to information in the foreign press, aviation units equipped with the A-10 attack aircraft are developing an operational tactic characterized by the flight of a group of aircraft to a target at altitudes of not more than 50 m. The aircraft maneuver upon beginning the attack run (in order to overcome air defense opposition). The attack of tanks and other installations will be accomplished from several passes and directions by pairs of aircraft using Maverick missiles, GAU-8/A aerial cannons, Snakeye bombs or cluster munitions armed with antitank bombs and mines. In this case, one aircraft must suppress the enemy's antiaircraft weapons while the other strikes the target.

In order to increase the intensity of air operations, the bloc's military command is carrying out a number of measures to reduce the aircraft readiness and turn-around times. In particular, maintenance is being reduced to a minimum, mechanized equipment is being used extensively to suspend the armaments and to carry out other labor-intensive operations. Ground service personnel are regularly being trained to rapidly prepare the aircraft for sorties. For this very purpose the U.S. Air Force Command in Europe requires that units equipped with the A-10 attack aircraft master the execution of the maximum number of sorties possible (up to three or four) without refueling. In this case, the time is used only to reload ordnance when turning the aircraft around for a combat sortie.

According to evidence in the foreign press, in the air forces of the NATO countries, particularly in the United States, a great deal of attention is being devoted to conducting radioelectronic warfare. Along with the radioelectronic warfare aircraft on hand and the equipping of combat vehicles with various apparatus for the same purpose, work is being carried out in the United States on building special EF-111 aircraft (planned purchase of 40) and the F-4G Wild Weasel (116, out of which 46 have already been adopted by two TAC squadrons). The first such aircraft have already begun entering the inventory of the U.S. Air Force in Europe. According to the calculations of American experts, the efficient use of EF-111 aircraft will reduce the likelihood of the tactical fighter strike groups and the attack aircraft being intercepted by enemy aircraft by 75 percent. It will also reduce the effectiveness of antiaircraft fire by 30 percent.

The F-4G is basically intended to be used to accompany strike groups for the purpose of detecting and suppressing air defense radar systems with the aid of antiradar missiles and other weapons.

The combat training of the NATO air forces is directed at further increasing the combat readiness and combat efficiency of aviation units.

Combat training is organized basically within the squadrons and is conducted as training for individual crews as well as for groups (pairs, flights, squadrons). In addition to perfecting their piloting techniques and their use of on-board weaponry, the flying personnel master tactical methods of conducting combat operations under various conditions and familiarize themselves with formation-flying procedures and coordination among themselves and with units of other types of armed forces, ground forces in particular. Tactical aviation crews learn to conduct flights at low and extreme low altitudes, to carry out aerial refueling, etc.

A special place in the combat training of the air forces is occupied by all the types of training and competition conducted within the framework of the armed forces of the individual countries and the bloc as a whole, such as Dawn Patrol, Arrow Express, Carbon Edge, Tactical Weapons Meet, Royal Flesh, etc.

During these exercises great attention is devoted to training crews and personnel of the ground services for carrying out combat operations when the enemy is utilizing weapons of mass destruction.

According to information in the foreign press, the crews, commanders and headquarters personnel of aviation units in the United States are being trained under conditions close to combat conditions in four basic programs (exercises), namely: Red Flag, Blue Flag, Green Flag and Gray Flag.

The Red Flag program includes periodic practice in conducting air combat and carrying out strikes on ground targets in order to master the tactics of combat operations with extensive application of radioelectronic warfare means and strong opposition from enemy antiaircraft defenses and fighter aircraft. More than 6,000 crews undergo this training yearly.

In the Blue Flag program the command and headquarters personnel learn to direct tactical aviation when executing close air support missions for ground forces. This makes it possible to impart to them the skills to evaluate a situation, rationally deploy air forces and coordinate with ground forces. Training is conducted four times per year. The results of these exercises are used to evaluate the training level of commanders and headquarters personnel and to appraise tactical concepts, management methods and the organization of air combat operations control.

In Green Flag exercises, the following problems are mastered: notifying the aviation units and bringing them up to combat readiness; planning air combat operations in basic operational directions toward the Warsaw Pact border for the purpose of inculcating in the commanders and headquarters personnel the skill to organize intelligence operations and deploy aviation resources for executing various combat missions; and conducting applied flight missions in imitation of attacks on 'enemy' troop formations, air defense suppression, the repulsion of air raids and the organization of radio-electronic warfare with one's own forces and with reinforcements. In two years 1,300 crews participated in these exercises.

In the Gray Flag program, measures are carried out that are directed at reducing (from 90 to 30 days) the time it takes to bring young pilots who have just joined the units up to a level of combat readiness. Other measures are directed at raising the level of combat readiness by subsequently training the aviation units to carry out specific combat missions. For example, squadrons equipped with F-15 fighter aircraft first begin by performing individual air-defense missions, then go on to achieving and maintaining air superiority. In accordance with this program, the following norms have been established for staffing aviation units with pilots: 1.34 pilots per aircraft (for units equipped with F-15's and F-4's), 1.77 for A-10's, 1.06 for F-16's and 1.1 for F-111's.

Accelerated pilot training and improvement in the organization of pilot conversion to new aircraft is being carried out in the Gold Flag and Ready Team programs.

In accordance with the first program (expected to run four to five years), provisions are being made to allocate 65 percent of aircraft sorties to training young pilots. In all, plans have been made to train 984 men, 25 percent of whom will be trained to flight commander level. In accordance with the program's requirements, it is recommended that flight personnel be freed from all additional duties not associated with flying.

The training in the second program will make it possible to reduce the period of time combat readiness is lost when air wings are reequipped with new aircraft: from 12 to 4 months when reequipped with the same type of aircraft and from 18 to 12 when reequipped with different aircraft. They plan to achieve this by forming an additional squadron in the wing being reequipped and by organizing the conversion training squadron-by-squadron as well as by maintaining combat readiness on the old aircraft until the reequipping is complete.

The requirements for monitoring the aviation units' combat readiness have been increased considerably. Whereas previously they were checked at their permanent bases with a considerable number of simplifications and conditions, the units are now checked under conditions as close as possible to combat. The aviation units redeploy to forward airfields and carry out combat missions together with units of other commands. Similar measures are being undertaken in the air forces of other NATO countries.

improvement in the systems of combat operations control is being carried out along the following lines: new automated control systems and their components (communications gear, processing and display of data) are being created and the systems previously adopted are being modernized; the structure of command organs is being improved; functional responsibilities among these organs are being redistributed; and instruction and training of personnel is being carried out more purposefully.

The foreign press devotes much space to the AWACS airborne warning and control system (E-3A aircraft) which was built in the United States. Plans have been made to equip the 552nd Airborne Warning and Control Wing (three tactical and one training squadron are being formed in it) with these aircraft in the near future. In addition, 18 such aircraft will be stationed in Western Europe.

The NATO military command is pinning great hopes on the AWAC system to increase the combat readiness and combat capabilities of its air forces. In the words of the U.S. Air Force Chief of Staff, it should make it possible not only to achieve the necessary flexibility in controlling aircraft guidance to airborne and ground targets but should also provide the command organs of NATO's combined air forces with data necessary for decision making.

In order to insure a high level of combat readiness for the system, it is planned to have two crews on each E-3A. In proportion to the degree to which the system is developed, plans have been made to proceed with mastering the control of air combat operations from these aircraft in conjunction with ground-based automated control systems. For the purpose of eliminating shortcomings present in the system and increasing its capabilities, plans have been made to: replace the basic programs that provide for the operation of the E-3A's on-board equipment by the end of 1979; introduce the JTIDS joint tactical information distribution system into service by the mid-1980's; and equip the E-3A with the means for self-defense and for combatting the enemy's electronic reconnaissance operations as well as with back-up target-tracking equipment.

Increasing the mobility[3] of aviation units makes it possible to insure rapid reinforcement of NATO's air forces in Western Europe by transporting forces deployed on the North American continent. It also makes it possible to shift the air forces' efforts from one direction to another in reduced periods of time. In recent years, as is noted in the foreign press, the intensity of such transfers has grown considerably. The commands of the Air Force Reserve and the National Guard and units of the Tactical Air Command participate in them. The transport of aircraft to Western Europe is combined with comprehensive checks of combat readiness and the participation of those air forces in exercises. At the same time, the number of dual-based airbases is increasing and the so-called "unequipped bases" are being developed. The utilization of individual sections of automobile highway as reserve airfields is simultaneously being mastered.

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[3] For more details on this matter see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE No 12, 1979 pp 51-56

In the U.S. Air Force's Black Flag program the new organization of aircraft maintenance and repair is being tested and introduced by groups of technical personnel who have been formed into squadrons according to the "integration of specialties" principle. This is being done in order to accelerate aircraft preparation and turn-around.

The improvement of maintenance in tactical units occupies an important place in the plans to increase the combat readiness and combat capability of the air forces of NATO countries. It is being accomplished along the following lines: by increasing the reserves of fuel, ammunition and spare parts at airbases located in Western Europe (plans have been made to first create a 30-, then a 60- and, finally, a 90-day mobilization reserve, while fuel and ammunition stocks are being equipped in an antinuclear respect); by making plans to organize the production of spare parts and the repair of American aircraft on the production base of the NATO countries; and by expanding bilateral cooperation between the United States and the FRG, Great Britain and certain other member nations of the North Atlantic bloc on the joint use of airbases and civilian airfields, the creation of joint storage facilities for ammunition and the standardization of weapons, fuels and other maintenance facilities. A number of other measures are being undertaken.

That which has been stated above once again testifies to the fact that the aggressive imperialist circles of the United States and of the NATO allies are actively preparing to unleash war against the USSR and the other countries of socialist cooperation while attaching great significance to the build-up of the strength of their air forces, tactical aviation first of all, and striving for continual improvement in its combat capability and combat readiness.
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NATO NAVAL FORCES: SOVIET REVIEW OF CAPABILITIES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 80 signed to press 10 Jan 80 pp 69-74

[Article by Capt 3d Rank V. Khomenskiy: "The Use of Naval Forces in the Northern European Theater of Military Operations (According to the Views of the NATO Command)"]

[Text] The results of the high-level Soviet-American meeting in Vienna became an event of great international significance. The Strategic Arms Limitation Treaty signed during the course of that meeting presents an opportunity for even more radical measures directed toward strengthening the security of peoples and reducing the threat of a new war.

However, such a turn of events in no way eliminates from the NATO bloc the enemies of disarmament. They stubbornly attempt to retard the development of positive processes in the world arena, intensify the arms race, step up their militarist preparations and strengthen the bloc's military structure, particularly its northern flank.

The territories and coastal waters of Norway, Denmark, the North German state of Schlesvig-Holstein and the straits zone of the Baltic Sea form the North European theater of military operations according to the NATO division. It is divided into three sections in the military-geographical respect: Northern and Southern Norway (the border between them runs along 65°N latitude) and the straits zone of the Baltic Sea. It extends 2200 km from north to south and is 470 km across at its greatest width.

Western military experts believe that the theater of military operations may play an important role in insuring favorable conditions for preparing and executing strategic operations in the Central European theater of military operations and for the operations of forces of NATO's strategic command in the Atlantic Ocean. Moreover, it makes it possible to control the Baltic straits and the sea lanes of the North and the Norwegian Seas as well as to deploy large naval formations in the adjacent waters and strike population centers and installations in the Soviet Union and other socialist countries.

The performance of these missions, in the opinion of the bloc's military and political leadership, will depend to a considerable degree upon naval operations. It is for this reason that the NATO Combined Naval Forces Commands in Northern and Southern Norway and in the Baltic straits, formed during peacetime within the framework of a NATO Combined Naval Forces Chief Command in the North European theater of military operations, are developing plans to conduct operations in their own zones and are speeding up the military training of the forces under their direction.

The NATO Combined Naval Forces Command in Northern Norway (headquarters in Bodö) has at its disposal a limited complement of forces (the Norwegian Navy, basically). It has up to 10 submarines, approximately 40 combat vessels and cutters and 5 land-based patrol aircraft. The Command's basic missions are: insuring the transport of troops and military cargo within its own zone; defending against landing forces on the coastal areas in Northern Norway; combating the enemy's naval forces, submarines first of all; disrupting enemy naval lines of communication; and conducting reconnaissance.

Foreign experts believe that close cooperation is necessary between this Command and the NATO strike fleet in the Atlantic and with the Chief Command of the NATO Combined Naval Forces in the Eastern Atlantic. In order to reinforce the ground forces, plans have been made to transport by sea to this region an expeditionary division of U.S. Marines, a brigade of British Marines and one or two amphibious landing forces from the navy of the Netherlands. Depending upon the situation of the naval forces gathered in the North European theater of military operations, the forces indicated or a part of them can be conveyed to the straits zone of the Baltic Sea or to Southern Norway. According to evidence in the Western press, the 42d and 45th Marine Battalions of Great Britain carry out their combat training yearly in Northern Norway, even in peacetime.

The transfer of troops and military cargo will be carried out in order to regroup troops within the limits of the territory of Northern Norway as well as to supply these troops in action in the coastal regions. For these purposes, plans have been made to utilize up to 10 landing ships and vessels. It is believed that the transit of ships through the coastal channels will be carried out with a minimum complement of security forces in view of the ships' natural defensive capability when located among the reefs in coastal regions. In individual sections of the coastal lines of communication where enemy submarines may be located, it is proposed that naval search-and-destroy groups be deployed and surveillance by patrol-cutters be organized.

As was reported in the foreign press, the geographic conditions of this region (a very jagged coastline, a limited number of areas accessible to landing forces) create favorable conditions for conducting antilanding defensive operations with a relatively small complement of forces having high maneuverability and striking power (when supported by coastal-artillery fire). For a more effective and purposeful defense from the sea, plans have been made for the organization of constant reconnaissance of likely areas for forming up detachments of enemy landing forces, the routes they would follow and the landing areas. Provisions have been made to conduct reconnaissance, first of all, with ground-based patrol aircraft (Norwegian "Orion" aircraft) and submarines deployed to antisubmarine positions between Nordkapp and the island [as published] of Medvezhiy and in the Bering Sea. In order to destroy landing detachments while they are crossing the sea, it is proposed that carrier-based aircraft of the Atlantic strike fleet be utilized.

The NATO Combined Forces Naval Command in Southern Norway (headquarters in Stavanger) is entrusted with the mission of defending the coastal lines of communications in the Norwegian and North Seas as well as in the northern portion of the Skagerrak straits. Moreover, a part of the forces at their disposal may be directed to reinforce the formations of the NATO Combined Naval Forces in the Baltic straits zone if it becomes necessary. Up to 5 submarines and about 40 combat ships, missile, torpedo and patrol cutters may participate in performing this mission.

The area of "responsibility" for the NATO Combined Naval Forces in the Baltic straits zone (headquarters in Karup, Denmark) includes the southwest portion of the Baltic Sea (to the west of the island of Bornholm), the Fehmarn Straits, Store Baelt, Lille Baelt, Öresund, Kattegat and Skagerrak as well as the eastern regions of the North Sea. Its strategic significance is determined by the fact that it is the connecting link between the North European and Central European theaters of military operations. It makes it possible to control the passage of ships from the Baltic Sea to the North Sea. Moreover, it cuts across the most important naval lines of communication of the member nations of NATO. There are about 700 trading vessels in the Baltic Sea daily and up to 150 of them pass through the straits zone and the Kiel Canal.

The fleets of Denmark and the FRG form the basis of the forces placed under the operational authority of NATO's Combined Naval Forces Command. As is reported in the foreign press, they number more than 250 combat ships and cutters as well as about 140 fighter-bombers and land-based patrol aircraft.

According to evidence in the foreign press, the NATO Combined Naval Forces in this zone have been entrusted with performing the following missions: blockading the Baltic straits; combating the forces of the enemy fleet in the Baltic Sea; destroying the enemy's lines of naval communication; supporting ground forces; defending against landing forces in the straits zone and the coastal regions of the FRG and Denmark; and defending the sea lanes in the North Sea and the Baltic straits. It is noted that the guarantee of their successful execution will be the organization of close coordination of the Combined Naval, Ground and Air Forces in the Baltic straits zone; with the Combined Air Forces in the Eastern Atlantic and in the English Channel zone; and with the Combined Naval Forces in Southern Norway.

In the opinion of the NATO Command, the capture of the straits zone by the enemy will sharply increase his capability to effectively employ the sea lanes for supplying his flank formations operating in the Central European and North European theaters of military operations. This would also make it possible to bring up a portion of his naval forces into the North Sea and the Northeast Atlantic, which would have a negative effect on the course of operations of NATO's Combined Naval Forces in the Atlantic. For this reason, NATO strategists are devoting exceptionally great consideration to the problems of blockading the Baltic straits, establishing control over the approaches to the Baltic and defending the islands.

As the foreign military experts believe, up to 120 combat ships, 15 submarines, more than 30 ASW (antisubmarine warfare) aircraft and helicopters and more than 30 fighter-bombers may be allocated from the inventory of the Combined Naval Forces of Denmark and the FRG. The operations of these forces may be supported by permanent formations of NATO's naval forces in the Atlantic and, when it is necessary, by an air strike group deployed in the North Sea region.

A special role is assigned to aviation in blockade operations. In the opinion of the NATO Combined Naval Forces in this zone, there are a number of cases in which aviation may prove to be the only force capable of striking the enemy on long approaches to the straits zone.

Provisions have been made to utilize submarines in a maneuverable-position method on the approaches to the zone. They will destroy enemy surface ships and submarines that have breached the straits zone, carry out reconnaissance, provide guidance for other fleet ships and carry out mine-laying operations.

Antisubmarine forces will operate along specially created antisubmarine lines on the approaches to the straits. Surface ships (squadron torpedo boats, frigates, ASW cutters) and ASW airplanes and helicopters may operate within the composition of these forces.

Major significance is attached to missile and torpedo cutters in the blockade of the straits. In the opinion of the foreign experts, they may operate effectively against combat ships, landing detachments and convoys. As the experience of NATO's naval forces in exercises shows, the methods they use to carry out operations in the Baltic straits zone will be distinguished by their great variety: individual and joint strikes, ambushes, etc.

Mines will find extensive application in the straits blockade. As is reported in the foreign press, plans have been made to lay mines both during the course of combat operations and ahead of time, in order not to allow the enemy fleet formations passage through the straits zone into the North Sea during the period of threat. Mine-laying will be carried out by submarines, land-based patrol aircraft, carrier-based aircraft, individual surface ships, cutters and transports.

Judging by materials in the foreign press, the laying of minefields directly in the straits and on the approaches to land-accessible sections of islands and coastline is envisaged in case the situation in the Baltic develops unsuccessfully and the loss of the straits zone threatens. This is done in order to freeze the enemy advance and prevent the landing of tactical and operational-tactical troops on islands located at key positions in the straits zone and on its approaches. In laying the mines, plans have been made to employ up to five mine-layers and a considerable portion of the combat ships and torpedo cutters, as well as specially equipped railroad and motor vehicle ferries. According to exercise experience, B-52 strategic bombers of the U.S. Air Force Strategic Air Command may also be used for this purpose in isolated areas of the zone.

It is proposed that coastal artillery participate also. Coastal artillery is capable of striking vessels while they are still on the approaches to the straits. In the opinion of NATO military experts, shore batteries deployed to advantageous positions may, under certain conditions, form the basis of the blockade operations.

Besides the defensive operations, the execution of blockade missions in the Baltic straits provides for offensive operations directed at destroying enemy formations that have penetrated from the Baltic into the straits zone. It also provides for forcing these formations into the southeast section of the Baltic Sea with a subsequent maximum limitation on their freedom of action. In this case, the execution of a combination of measures for the blockade of the straits zone and antilanding defenses will depend directly upon the course of battle with the enemy's naval forces in the Baltic Sea.

Judging by the reports in the foreign press, the NATO Command believes that the comparatively small dimensions of this sea limit considerably the feasibility of using large-scale surface ships in its open areas, since the ships are vulnerable to strikes from the enemy's fighter-bombers. Therefore, it is recognized as expedient to conduct aggressive military offensive operations on the approaches to the straits zone and in the Baltic primarily with submarine forces, missile and torpedo cutters and fighter-bomber aircraft with the broad application of mines.

Plans have been made to use the forces of naval fighter-bomber aviation (West German F-104G's) and tactical aircraft from the air forces of Denmark and the FRG to strike enemy naval bases and ports in order to put the ships based there out of commission. Massed aircraft will be used (up to 40 aircraft striking simultaneously from various directions) or in individual groups (not more than 10 aircraft in each).

Submarines will operate near enemy naval bases and ports, in the narrows and at sea lane junctions. They will act singly (by the position-maneuvering method) as well as in the composition of tactical groups. The dimensions of the positions are, as a rule, 10x10 or 30x30 miles. In view of the small size of the West German design 206 submarines, they are envisaged as aggressively conducting reconnaissance and laying minefields in the Baltic Sea shallows on the approaches to naval bases and ports, in narrows and along the deployment routes of the enemy ship formations.

Judging from materials in the foreign press, missile and torpedo cutters are believed to be effective means for conducting operations against surface ships and transports under the conditions in the Baltic Sea. It is proposed that they be used to make up homogeneous strike groups (8 to 10 cutters in each) as well as in coordination with surface ships (1 or 2 surface ships and 5 or 6 cutters) and with naval aircraft of the FRG and tactical aircraft from Denmark. Their missions: advances against mooring positions and raids on the enemy, attacks on detachments of combat ships, mining of navigational channels, disruption of coastal sea lanes on the approach to the straits in the western portion of the Baltic during the night hours or under conditions of poor visibility.

Provisions have been made to conduct antisubmarine warfare with the help of ground-based patrol aircraft of the West German Air Force (up to 20 "Atlantic" aircraft) as well as with the help of search-and-destroy naval groups operating independently or in conjunction with airplanes and helicopters. Ground-based patrol aircraft carry out the search for submarines in specially designated regions. The basic means of detecting submarines are radioacoustic bouys (active and passive), electromagnetic detection, gas-analyzers and radar stations. The basic means of destroying submarines are depth charges, homing torpedoes and torpedo-missiles. An important role is assigned to mines in the plans for combating submarines.

The disruption of the enemy's lines of communication in the Baltic Sea has as its objective the defeat of the enemy's troop and equipment transport within the boundaries of the theater of military operations and the denial of passage to convoys and landing detachments on their way to islands in the straits zone. Its other goal is to hinder to the maximum degree possible the logistic support of ground forces in the coastal regions and naval forces at sea during the period in which combat operations are being conducted. This mission is one of the components in the combination of measures for the defense of the Baltic straits from the sea and will be carried out through the coordinated actions of naval and air forces. The extensive utilization of fighter-bomber aircraft along with submarines and naval strike groups is contemplated for striking convoys and landing detachments as they cross the sea.

The rendering of support to the ground forces is being examined as one of the chief missions of NATO's Combined Naval Forces in the Baltic straits zone. As the western press emphasizes, provisions have been made to reinforce troop formations, in the state of Schleswig-Holstein first and foremost, by transfering troops, combat equipment and cargo by sea from other theaters of military operations as well as by maneuvering forces within the boundaries of the zone. For this purpose, plans have been made to use the landing craft, ships and ferries on hand as a convoy (including up to 10 landing craft and ships guarded by 3 to 6 escort and antisubmarine vessels). Air support is entrusted to aircraft of tactical aviation. Upon pursuit of convoys in the North Sea, air support is entrusted to carrier-based aircraft of the NATO strike force in the Atlantic.

Defense against landing forces in the straits zone will be carried out through the joint operations of ground, air and naval forces. The interaction among the services of the armed forces, organized according to boundaries and time, will include the coordinated operations of carrier-based and tactical aircraft (when striking landing vessels and transports in the areas where landing troops are being loaded), of aviation and naval forces (when striking the landing facilities as they cross the sea) and of ground forces, aviation, coastal artillery and naval forces (when striking the landing force at the moment it hits the beach and begins operations to secure a beach-head).

It is proposed that the immediate defense of the islands and coastal regions be conducted by ground forces, elements of the Danish hemwehrn and tactical aviation, when supported by coastal artillery. In the interests of anti-landing defenses, it is planned that minefields be laid ahead of time on the approaches to landing-accessible sections of the islands (two or three lines 0.5 to 2 km from shore).

The defense of the naval lines of communication in the North Sea and the Baltic straits presupposes that the following measures be carried out: the evacuation of commercial ships from the threatened regions to the Atlantic; the defense of convoys that arrive bringing troops and materiel; and the defense of small coastal convoys. It is contemplated that the commercial ships will be evacuated and naval control over shipping be introduced. In accordance with this, ships will be brought out of port in good time, will arrive at assembly points and will form convoys which will be defended along the routes to safe regions in the Atlantic. In order to defend the convoys located along the coast or in the straits zone, it is envisaged that torpedo cutters in strike groups (3 or 4 cutters in each) be utilized.

The NATO Command is constantly refining and improving its plans for conducting combat operations in the North European theater of military operations. While giving the most serious consideration to this region, it is carrying out the purposeful training of the member nations' naval forces. During numerous exercises of the national fleets and the NATO Combined Naval Forces (Team Work-76, Northern Wedding-78, Bright Horizon, etc.), they mastered existing and developed new tactical methods for utilizing their forces against enemy ship formations, for conducting naval landing operations for the purpose of rendering support to the ground forces, for the blockade of the straits zone and the defense of their own naval lines of communication. Moreover, the problems of using prospective forces and weapons for naval armed combat are being investigated.
[224-9512]

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ANTISHIP MISSILES: SOVIET REVIEW OF NATO DEFENSIVE MEASURES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 80 signed to press 10 Jan 80 pp 81-84

[Article by Capt 2d Rank V. Morozov: "Development of the Means to Combat Antiship Missiles"]

[Text] At the present time the naval forces of the countries in the aggressive NATO bloc have not yet fully solved the problem of combating aerial targets, particularly low-flying antiship missiles (PKR's). In the opinion of the foreign experts, the guns and the antiaircraft weapons systems adopted for shipboard use are by themselves incapable of destroying different classes of targets at various ranges and altitudes.

It is believed, for example, that small-caliber naval gun mountings in conjunction with modern fire-control systems can successfully combat aircraft and first-generation antiship missiles at ranges of up to 5000 m. Medium-caliber gun mountings are also sufficiently effective for combating similar targets, since their slower rate of fire is compensated for by their greater guidance accuracy and the use of projectiles with proximity fuses (in the future--guided projectiles). However, in the opinion of Western military experts, they have a lower kill probability on aerial targets located at low (less than 1°) and high (more than 45°) angles of elevation. Moreover, fire from the gun mountings does not insure a high kill probability on the missile's semiarmored warhead which, even when the missile's other components are destroyed, presents a serious danger to the ship at close range.

As is noted in the foreign press, the shortcomings of antiaircraft guns were taken into account during the creation of the second generation of such missiles and during the development of prospective antiship missiles. These missiles are capable of flying at low or extreme low altitudes and of executing a maneuver to evade antiaircraft defenses by increasing the angle of attack to 55° and more on the final leg. Speeds of antiship missiles are being increased to Mach 2 and more. The tactics for their application under various conditions are being improved (salvo fire, course changes on the route leg, etc.). In addition, missiles equipped with homing heads that are resistant to radioelectronic suppression are entering service and the armored shielding on their warheads is being made stronger. All of this reduces the guns' ability to destroy antiship missiles and makes it necessary to seek other weapons for combating them which would have a minimum reaction time and sufficiently great firepower.

Antiaircraft missile systems do not have many of the shortcomings that gun mountings have, but their large dimensions, the complexity of the installation, the high cost and vulnerability to radioelectronic warfare do not make it possible to consider them as a general-purpose weapon for destroying all possible aerial targets nor to install them on ships of every class and use them in various tactical situations.

Research conducted recently in the navies of foreign countries shows that warfare against aerial targets should be carried out in a coordinated manner with the use of all shipboard weapons available. At great ranges and altitudes this mission can be carried out by long-range antiaircraft missile installations. At medium ranges and altitudes this is done mainly by medium-range antiaircraft missile installations and partly by medium-caliber gun mountings. At close range and low altitudes it is performed by antiaircraft missile installations and close-range gun mountings. In the opinion of foreign experts, antiship missiles will be detected with the greatest probability in the close-range zone. It is noted that the question of which weapon is best and most promising to use for combating antiship missiles at close range is as yet still undecided. For this reason, antiaircraft missile installations (Seawolf, NATO Sea Sparrow, ASMD [Antiship Missile Defense], Crotale) and close-range small-caliber gun systems (Vulcan-Phalanx, EX-83, Goalkeeper, etc.) have been created in the West. In addition, new ways are being sought to develop weapons for combating modern, low-flying targets.

For example, the British firm of Hanting, together with the firms of Marconi, Ferranti and Vickers, is developing the Seafox automatic salvo-fire system. In the opinion of the foreign experts, it should provide surface ships with good protection from antiship missiles attacking from one or several directions at subsonic and supersonic speeds. It is expected that it will also be effective in combating airplanes, helicopters and guided glide bombs. It may be used for bombardment of ships and shore installations.

Plans have been made to use the Seafox either independently or in conjunction with gun mountings and antiaircraft missiles in accordance with the tactical situation.

Depending upon the class of ship, it is proposed that two or more launch complexes (each weighing 1.4 t without ammunition), including the automated fire-control system with computer, a six-barrel launcher and a free-flight rocket complement be installed. All the launch systems are served by a separate computer, a three-dimensional acquisition radar and a heat-vision unit for target search.

The six-barrel launcher (by Vickers) is made from corrugated sheets of stainless steel (to reduce weight) and should weigh about one ton. A hydraulic drive insures guidance at high speed with great acceleration and provides the necessary accuracy of synchronization with the fire-control radar system. Each mounting can fire two salvos of three free-flight rockets each. The launcher will be reloaded manually through the front face of the barrel.

The Seafox free-flight rocket (chief developer—Hanting) consists of a powerful warhead (50 to 70 percent of the rocket's total weight), a solid-fuel motor and folding fins. The warhead may be high-explosive fragmentation or directive-burst fragmentation utilizing rod-shaped projectiles.

The high-explosive fragmentation warhead destroys the antiship missile upon contact with it, while the directive-burst projectiles penetrate the armor shielding on the missile's warhead and cause its detonation. High-explosive fragmentation and directive-burst warheads may be detonated with proximity fuses. Solid fuel is planned for use in the rocket motor. It has a high rate of burn and creates great pressure in the combustion chamber, which insures the rocket's supersonic flight.

The three-dimensional radar (by Marconi) will scan the entire upper hemisphere and will determine three coordinates for the target. The acquisition radar antenna is of an essentially new design, without revolving high-frequency components and radar scanning through mechanical displacement of a lightweight reflector. A similar antenna operating in the K-band will be utilized in the automated fire-control system.

The heat-vision unit (Ferranti, infrared band of 8-14 μm wavelengths) will carry out the search for targets under conditions of heavy radielectronic suppression, when acquisition radar is ineffective, or in periods of radio silence.

Principle of operation: target indications from the acquisition radar pass through the computer and arrive at the automated fire-control system which, having locked onto the target, transmits data to a computer (Marconi). Taking into account the constant input of information on the motion components of the firing ship and the direction and force of the wind, it processes data for automatically guiding the launchers and opening fire. During fire the automated fire-control system not only tracks the targets but also the rockets of the first salve. Thus, in case of a miss, a second salvo may be fired.

According to the calculations of the experts who developed the system, the Seafox will have its greatest kill probability at a distance of 500 m from the ship. They maintain that at such a range the dispersion of the free-flight rockets in the salvo will not exceed 2-4 m, which will insure a sufficiently high probability of target kill. Important arguments that favor the future of this kind of weapon are the calculations of the experts and the comparative assessment of this weapon according to cost effectiveness criteria. They show that the Seafox system will outperform existing antiaircraft missile installations and close-range gun systems. As is indicated in the foreign press, the cost of the system is less than half the cost of any traditional weapon for combating antiship missiles, while one free-flight rocket salvo amounts to only six percent of the cost of a single antiaircraft missile.

The Catulle automatic shipboard system is being developed in France. It is intended to combat low-flying aerial targets, including antiship missiles. It is based on the Javelot ground mobile system for firing free-flight rockets.

Experts from the firm of Thomson-Brandt, the builder of this system, believe that it will combine the quick reaction time and high rate of fire inherent in small-caliber gun mountings with the accuracy of close-range antiaircraft systems. In their opinion, such a system will increase considerably the antiaircraft and antiship missile defenses of surface ships.

The Catulle is a composite design, including 64 free-flight rocket launchers in the form of 40-mm tubes and fire-control apparatus equipped with electro-optical sensors and a separate computer. This device will carry out target search, identification and tracking in the automatic mode, will process the firing data and will salvo-fire the free-flight rockets in a given dispersion.
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Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 4,
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*Foreign press material was used for preparation of articles by Soviet authors and for news items.

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RAPID DEPLOYMENT FORCE: SOVIET COMMENTS ON ITS ROLE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 4, Apr 80 signed to press 7 Apr 80 pp 9-13

[Article by Maj S. [illegible]: "The Rapid Deployment Force: A Tool for U.S. Aggression"]

[Text] Recently, bellicose imperialist circles have sharply speeded up their activities to disrupt detente and to increase the fear of war and international tension. Especially diligent in this job are several Pentagon officials, NATO leaders and the Chinese hegemonists who have joined up with them on an anti-Soviet platform. These are the circles that have made a maximum effort to stop ratification of the Soviet-American Strategic Arms Limitation Treaty. They are the ones who are reviving "gunboat diplomacy" (whose role is being filled by aircraft carriers today), stirring up anti-communist hysteria, making a sensation of the "Soviet military threat" that they themselves made up and are trying to turn the world back to the time of the "cold war."

Reliance on military strength has always been an integral part of basic U.S. foreign policy. From time immemorial, the State Department and Pentagon leaders have looked at military strength as the primary, ultimate means for "settling" vexing foreign policy issues.

The role and place of armed forces in U.S. foreign policy has been vividly incorporated in the "national security" doctrine which was adopted in the second half of the 40's. This doctrine "explains" the interrelationships among so many diverse political, economic and military factors, emphasizes American historian D. Yergin, that the development of events throughout the world takes on a direct, automatic relationship to vital U.S. interests. According to him, the American doctrine, which is permeated by a spirit of expansionism, makes it possible to arbitrarily set the limits of U.S. interests and security in any region of the world.

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according to Army Chief of Staff Gen. E. Meyer, is to guarantee an interrupted flow of Arabian oil in an emergency or crisis situation in the Persian Gulf or other "hot spots."

Even the Western press, which has grown accustomed to sensational stories, was shocked by such statements. For example, the French newspaper LE MONDE frankly pointed out that a major world power's intention to occupy the Arab oil producing countries if there is any interference in its oil supplies is undisguised cynicism, a shocking violation of the people's right to manage their national resources and a return to the law of the jungle, to the time of colonialism and "gunboat diplomacy."

The plans for establishing and employing the Rapid Deployment Force, foreign observes emphasize, grew out of the same soil as the poisonous shoots of neocolonialism did. They are directly targeted at guaranteeing American dominance in the Third World by using military force when political and economic factors have misfired.

The idea of establishing a military unit designed to intervene in the internal affairs of the developing countries is not new. It had already appeared by the end of the 50's. Later, the Pentagon supplemented it with the strategic concept of "one and a half wars"; according to this concept, the American armed forces must be able to wage a large war in Europe and a small ("half war") war in areas outside the aggressive NATO bloc's area of responsibility. At that time, the U.S. had already started developing mobile land forces or, as they were called, "fire fighting teams" designed to be airlifted to "threat areas," or, in other words, to countries whose people refused to act at Washington's bidding. These American units were used in Vietnam for the first time and they laid the foundation for escalating U.S. aggression in Indochina.

The current concept of establishing a Rapid Deployment Force was based on the most reactionary U.S. circles' ideas that it was necessary to expand American military presence in the world and to earmark a special military contingent for local employment, primarily in the developing countries.

At present, these forces of intervention are being formed. According to data from the American FORTUNE magazine, they will consist of the 82nd Airborne Division (15,200 men) and the 101st Air Assault Division (17,900 men)--which have gained experience in conducting aggressive combat operations in Vietnam--as well as other Army units, Marine units and 5-6 air wings (each with 72-135 aircraft). They may also be reinforced by 1-2 carrier groups, a surface ship squadron, assault landing craft, etc. The total strength of the Rapid Deployment Force will be 100,000-110,000 men. However, foreign specialists believe this is only the tip of the iceberg --the most mobile component of the American interventionary forces. According to calculations by the French newspaper LE MONDE DIPLOMATIQUE, about 28 percent of American armed forces personnel, which is approximately 600,000 men, may be allocated to conduct combat operations outside the U.S. and NATO's "area of responsibility."

Western military specialists believe that the number and composition of the presently earmarked interventionist forces will primarily guarantee accomplishment of the missions assigned to them by the American administration pursuant to the U.S. global strategy.

According to foreign press reports, a specific program has been outlined to implement the Pentagon plans mentioned above; funds from the DOD FY 1980-81 budget have already been allocated for this program. Initially, plans call for allocating 58 million dollars to establish 14 new units (primarily combat support and combat service support units) and to increase the strength of existing units by approximately 2,000 men. These units' mission will basically consist of providing materiel support to the Rapid Deployment Force. It is also planned to procure highly mobile, heavy field artillery pieces and modern CH-47 troop transport helicopters for the forces' units. Plans also call for reequipping the artillery battalion with 155-mm howitzers. These are the objectives that the U.S. plans to spend approximately 9 million dollars on over the next 5 years.

Right now, at several military bases in the southern states where climatic conditions are similar to those in the Middle East and also at several American bases abroad, intensive training is underway for the forces of intervention. Training in desert operations and in operations to seize oil fields has already been given to 48,000 servicemen.

To implement their plans for armed intervention, American forces command elements and staffs are estimating the time and transportation resources required to lift the entire Rapid Deployment Force or part of it from the U.S. to various parts of the world. For example, according to the assessment of American experts, the projection of the two most mobile army divisions (the full complement of the 82nd Airborne Division and the 101st Air Assault Division) using the Military Airlift Command's existing transports will take at least 28 days. If the requirement is to use a conventional mechanized division instead of one of the airborne units, there is a significant increase in the airlift time. It is believed that the 82nd Airborne Division's independent (advance) units can be projected to the Persian Gulf within two days.

Because of this, U.S. military specialists have some doubts about the feasibility of the strategic airlift of such a large armada of expeditionary forces. However, within governmental circles, it is believed that when it draws up its military plans, the Pentagon should focus on "the efficacy of U.S. alliances with friendly countries. Specifically, the foreign press emphasizes the possibility of a Rapid Deployment Force troop lift to the Middle East without their equipment and heavy weapons, which plans call for prepositioning at Israeli depots. The Israeli Air Force could then provide air cover for the American forces assault landing and deployment.

To prepare for a "half war," the Pentagon is feverishly looking for ways to expand existing military bases and establish new ones in the "world's hot spots." This is why U.S. Secretary of Defense H. Brown candidly stated: "We are on the verge of establishing strategic posts in such areas as the Persian Gulf and the Strait of Malacca." In 1979, the U.S. was able to deploy radar sites in Oman to monitor ships passing through the Strait of Hormuz from the Persian Gulf to the Indian Ocean and it also was given the opportunity of making permanent use of an air base on the Isalnd of Masira (Indian Ocean) which was previously controled by the British.

The Egyptian government has decided to put two bases (an air base and a naval base) near Sharm el Sheikh in the Sinai at the disposal of the U.S. as soon as Israel transfers this part of the peninsula to Egyptian authorities. The Pentagon will finish up these bases and will also build two air bases for Israel in the Negev desert. Based on instructions from military authorities, American construction companies must complete these arrangements within three years and not within the five years previously anticipated.

The Pentagon plans to spend almost 5 million dollars in 1981 to rennovate Roberts International Airport in Liberia; it will serve as one of the primary staging bases in the event of an American troop lift to Africa.

It has also been reported that accomplishment of the missions assigned to the Rapid Deployment Force will be guaranteed by using the American forces strong points on Okinawa and in the Philippines. In January of this year, a major American exercise called Magex-80 was conducted in South Korea; 4,000 marines from

Rapid Deployment Force units were airlifted to participate in it.

Considering the fact that the American continent is very far away from several of the anticipated areas of operations for the interventionist forces, the Pentagon attaches special importance to its programs for increasing heavy military transports. Plans specifically call for modernizing the C-5A and the C-141 and also for developing a new STOL transport and putting it in service. According to the assessment of American military experts, the implementation of these programs will make it possible, for example, to reduce the time for airlifting a division from the U.S. to the Persian Gulf to one week.

At the same time, thorough preparations are being made for anticipated American airlift routes to foreign areas. For example, the White House extended the lease on the air base in the Azores (Portugal), which serves as a way station for military aircraft flying from the U.S. to Europe.

In justifying its intervention in the affairs of sovereign nations, the Carter administration relies on the United States "historical responsibility" and its readiness to use armed forces when necessary in areas that it considers strategically important. As reported in the American press, the 1977 Presidential Directive No 18 emphasized the requirement to significantly increase American general purpose force maneuverability and this provided the justification for a rapid reaction. It stated that the side which is able to project its forces directly into a crisis area first will have significant advantages and the adversary will have to dislodge them.

The U.S. pretention of viewing practically the entire world as within the sphere of its immediate interest was enuciated by the Assistant to the President for National Security Affairs, Z. Brzezinski: "American military power must be able to defend our interests abroad, including three important strategic areas outside our hemisphere: Western Europe, the Middle East and the Far East." This proposition is being borne out in practice--by transforming Western Europe into a launch pad for American missiles, by establishing the Rapid Deployment Force to intervene primarily in the affairs of the Middle East, by strengthening American military power in South Korea and others.

So, American strategists are urgently trying to find ways and means to increase the flexibility and effectiveness of using military force as an instrument of foreign policy while stubbornly ignoring the fact that a mere build up in military potential does not at all increase the possibility of making practical use of it in the modern environment.

With the further intensification of imperialist preparations, it is comp'etely understandable that the Soviet Union and the other socialist nations cannot remain apathetic toward the dangerous actions of U.S. and NATO militarists. The USSR will continue to see to it that its security and its allies security are strengthened.

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U.S. TACTICAL AIR COMMAND: SOVIET REVIEW OF ORGANIZATION

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 4, Apr 80 signed to press 7 Apr 80 pp 43-49

[Article by Col V. Aleksandrov: "The USAF's Tactical Air Command"]

[Excerpts] In following an aggressive policy which is dangerous to peace, U.S. imperialist forces are continuing the arms race and building up the fighting strength of all the Armed Services. An important spot in the Pentagon's military preparations is being given to tactical aircraft--the most flexible general purpose force component with high mobility and the capability to accomplish a broad range of missions both in conjunction with the other Armed Services and by itself.

Organizationally, the USAF's tactical air forces are combined in four commands: the Tactical Air Command, United States Air Forces in Europe, Pacific Air Forces and the Alaskan Air Command. Part of its forces are also drawn from the Air National Guard and the Air Force Reserve.

This article was drawn from materials in the foreign press; it covers TAC's organization and personnel, gives a brief description of it and discusses the long term prospects for developing TAC--one of the American Air Force's primary commands.* According to the Pentagon leadership's views, TAC units are considered to be a mobile strategic reserve designed for combat operations in overseas theaters of operations and for reinforcing air forces located there or for deploying new air groups. The headquarters is located at Langley AFB, Virginia.

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*See also the comment on p. 58 of this issue.--Ed.

Administratively, TAC is subordinate to USAF Headquarters; operationally, it is part of two unified commands: U.S. Readiness Command (MacDill, Florida) and the Atlantic Command (Norfolk, Virginia). In addition, TAC cooperates with the North American Air Defense Command and earmarks part of its forces for NORD.

Within USREDCOM, TAC is responsible for supplying the combat ready forces required to organize special operational groups (Army and AF) which can be rapidly deployed to overseas areas by order of the Joint Chiefs of Staff. In peacetime, TAC Headquarters draws up operational plans for the deployment of tactical air forces to Europe, the Pacific, Alaska and in other areas of the world. These plans are tested and adjusted during major USREDCOM joint exercises and also during TAC's own exercises.

Within LANTCOM, TAC is responsible for deploying AF units to areas in the Atlantic and Carribean Sea and it participates in LANTCOM exercises.

TAC actively interacts with other USAF commands. It specifically interacts with other commands to develop new weapons and operational equipment, to supply units with required supply items and to train flying and technical personnel--Air Force Systems Command, Air Force Logistics Command and the Air Training Command. When tactical air units are deployed overseas, TAC and SAC (the Strategic Air Command) coordinate on providing them with tanker aircraft while MAC (the Military Airlift Command) provides the aircraft required to airlift support group personnel and the equipment required. In addition, MAC provides flight weather support and also search and rescue activities for tactical air units.

TAC Headquarters supervises operational and combat training for the Air National Guard and Air Force Reserve units assigned to it; it trains personnel for tactical air groups deploying outside the U.S. and it conducts crew transition training to new aircraft.

The command includes the 9th and 12th Air Forces, the Southern Air Divison, the Tactical Air Warfare Center, the Tactical Fighter Weapons Center and the 552nd Airborne Warning and Control Wing (the AWACS system). The command's organizational structure is shown in Figure 1. [Figure not reproduced.]

TAC's primary forces are concentrated in the two armies which are the highest operational formations.

Foreign military specialists emphasize that USAF's TAC is an important component of American general purpose forces. TAC is making arrangements for a radical qualitative renovation of the Air Force's tactical aircraft and for transition training into the new aircraft; and it is developing the most effective methods for employing them in combat. It has large, well-maintained reserves of tactical fighters, reconnaissance aircraft and special-purpose aircraft which are able to rapidly deploy to various areas in the world.

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CRUISE MISSILES: SOVIET REVIEW OF U.S. GUIDANCE SYSTEMS

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[Article by EngrCol V. Konstantinov and Doctor of Engineering, EngrSrLt A. Bokov: "Cruise Missile Matching Guidance Systems"]

[Excerpts]

In its attempts to draw the world into a new round in the arms race, the U.S. military industrial complex is placing a great deal of reliance on developing cruise missiles which the Pentagon views as an important means of implementing the imperialists' aggressive plans. According to the claims of American military specialists, the cruise missile has a high kill probability for various targets; this kill probability is facilitated to a great extent by the guidance system used on the missiles. The guidance system is based on an inertial navigation system whose operational accuracy is judged by the magnitude of the missile's deviation from a preplanned route. Under the influence of various factors, the inflight deviation can increase and may reach large magnitudes (up to several kilometers); therefore, to enhance the missile's terminal target accuracy, it is necessary to periodically adjust the flight trajectory. In practice, this is accomplished using various systems (matching systems) which correct the inertial system's data.

According to foreign press reports, the matching systems developed or under development in the U.S. use constant physical characteristics of the target or surrounding area, for example, the terrain relief or the Earth's magnetic field, to determine the missile's precise location.

The theoretical basis for the matching systems is image recognition, i.e., one of the research areas in simulating artificial intelligence. Although several of the systems have already undergone flight testing, research in this area has not stopped as evidenced by the large stream of publications in the foreign press.

American specialists point to two technological achievements which led to success in developing a new generation of matching systems. First, the development of matching algorithms for a digital computer; and, second, joint use of matching and inertial systems. In the latter case, the matching system is used to correct the inertial system only during predetermined phases of the missile's flight route, which significantly reduces the volume of measurements required.

At present, judging from foreign press reports, the U.S. has several types of matching systems in various stages of research and development. Foreign specialists classify them according to the physical characteristics received by the imagery sensor. They therefore distinguish the following matching systems: gravitational, geomagnetic, radiometric, infrared, radar, optical and also those which use the terrain relief or skyline.

Because the first four systems are based on the Earth's various physical fields, these systems are called physical field guidance systems in some foreign publications. The last four types are sometimes called terrain mapping guidance systems.

Each system has its own special features which determine its most efficient operational methods and employment principles and also each has certain limitations caused by the physical characteristics of the fields used.

Published below is information compiled from foreign press articles on several of the matching guidance systems designed for the American cruise missiles being developed.

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STRATEGIC BOMBER: SOVIET COMMENTS ON NEW U.S. MODEL

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 4, Apr 80 signed to press 7 Apr 80 pp 56-57

[Article by Engr Col V. Kirsanov: "U.S. Plans for Building a New Strategic Bomber"]

[Text] In their desire to ensure military superiority over the Soviet Union, U.S. militaristic circles are submitting plans to build new strategic weapons. Recently, the American press has carried reports that the USAF has returned to the issue of updating the current FB-111 medium bomber and of developing a new strategic aircraft based on it, one with an intercontinental range and the capability to penetrate enemy air defense at extremely low altitudes.

Previously, in 1977-1978, at the USAF's initiative, General Dynamics developed preliminary proposals to convert the FB-111A into the FB-111H bomber.* However, at that time, this program was not supported by the U.S. political-military leadership; therefore, the appropriations required to develop it were not included in the DOD budget. Now, the USAF is proposing to convert existing FB-111A medium bombers (66 aircraft) and F-111D fighter bombers (89 aircraft) to FB-111B and C strategic bombers, respectively (see Figure) [figure not reproduced] and thus put 155 new strike aircraft in service with the Strategic Air Command (SAC).

According to USAF requirements, the new bomber's fuselage should be 4.5 m longer and 0.9 m wider than the FB-111A's fuselage; this will make it possible to install an extra fuel tank in it and to increase internal fuel tank reserves to 30,600 kg. Since plans call for equipping the FB-111B and C bombers with the F-101 low consumption engines designed for the B-1, American specialists intend to increase the flight range to 9,260 km without ariel refueling. They believe that the aircraft will then be able to make an extended flight at altitudes of approximately 60 m at a cruise speed of 0.85 Mach and it will be able to increase this speed to 0.95 Mach when penetrating air defenses.

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*See ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 6, 1978, pp. 104-105, for information on it.

According to estimates by experts from General Dynamics, the FB-111B and C will be able to carry up to 12 nuclear weapons: the SRAM air-to-surface guided missile or nuclear bombs (6 on the fuselage bomb stations, 2 under each wing and 2 in the bomb bay). According to foreign press reports, the current FB-111A can only carry six nuclear weapons in its standard combat configuration. Plans also call for designing in the capability of arming the FB-111B and C in the future with the supersonic, multi-role ASALM missile which is under development. To enhance the bomber's capability to penetrate the air defense system, plans call for outfitting it with new electronic warfare equipment.

Since the update will result in a maximum take off weight of 63,500 kg for the FB-111B and C, provisions are being made to develop stronger gear or them which will be able to withstand the increased load during take off and landing.

In the opinion of American specialists, deliveries of the 155 new FB-111B and C bombers to SAC units will be completed by 1985 if the necessary appropriations are made for this purpose.

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AMPHIBIOUS OPERATIONS: SOVIET REVIEW OF NATO TACTICS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 4, Apr 80 signed to press 7 Apr 80 pp 59-63

[Article by Candidate of Naval Science and Lecturer, Col N. Vorontsov: "Engineer Support for Defense Against Amphibious Assault"]

[Text] The U.S. armed forces command element and their allies in the aggressive NATO bloc believe that, in conjunction with the execution of assault landing operations--a special type of offensive combat operation--in modern warfare, it is also possible to conduct anti-assault landing operations. The most important component of the latter is organized coastal defense to destroy the enemy assault landing force while it is landing on the beach.

As pointed out in the foreign press, in organizing defense against amphibious assault, a great deal of attention is devoted to engineer support for it, specifically: conducting engineer reconnaissance; improving defensive positions, areas, belts and lines; establishing and building up an engineer obstacle belt, preparing demolitions and flooding; preparing and maintaining routes and crossings to support troop insertion, evacuation and maneuver along the shore and for delivering counter attacks (counter thrusts); carrying out camouflage operations and making engineer area damage control arrangements; getting and purifying water and preparing water supply points; building airfields and landing strips; establishing and maintaining facilities at command posts, communications centers and rear area installations; and securing the beach seized with a counter attack or a counter thrust or after the enemy amphibious assault landing is repelled.

The execution of these measures, Western military specialists emphasize, will be assigned to units engaged in the defense, to engineers and, in isolated cases, to local civilians.

Judging from foreign press materials, the U.S. infantry or mechanized division assigned to coastal defense usually prepares a battle area with a 30-60 km frontage and a 20-50 km depth. Within these borders, they prepare a division forward defended area (10-25 km in depth) and a reserve area (10-25 km).

The forward defended area is the basic element in defending against amphibious assault. It contains brigade areas of responsibility (including battalion defensive areas and company and platoon strong points), a security area (in probable assault landing sectors), firing positions, command posts and beach obstacles in the water and on the beach. As pointed out in the American military press, the battalion defensive area has a frontage of approximately 5 km and a depth of 3-5 km; for the company strong point, they are about 1.5 and 1 km, respectively, and for the platoon strong point, they are 400 and 200 m.

The type and extent of improved positions in the forward defended area depend upon the time and resources available and also upon the importance of the defended sector. During hasty engineer preparations, the basic works will be 1 and 2-man firing trenches with standard overhead cover, infantry weapons pits, artillery pits and tank pits. At command posts, they have hasty observation structures, slit trenches and dugouts. Western military specialists believe that firing trenches dug to a depth of 1.8-2 m at a distance of 1,000-1,200 m or more from the epicenter of a 20 kt nuclear burst will not be destroyed and the personnel in them will not be injured. According to their assessment, open works reduce initial radiation exposure by a factor of 10-12 while trenches with a 50 cm thick dirt cover reduce it by a factor of 300.

Later on, covered trenches, connecting trenches and dugouts may be built for personnel. When building them, it is recommended that they make widespread use of improvised and local materials (brush wood, brush wood mats, tarpaulins, sandbags and authorized, high-strength synthetic covers). In the opinion of NATO specialists, the covered areas will protect personnel at a distance of 900-1,000 m from the epicenter of a 20 kt nuclear burst while the standard dugouts will protect them at a distance of 700-800 m.

Deliberate engineer preparations of the forward defended area make provisions for constructing shrapnel-proof covered weapons emplacements and observation fortifications, dugouts, light field shelters, covered or revetted deep trench areas and connecting trenches, and cut-and-cover radar pits, combat vehicle pits and transport vehicle pits.

In the division's reserve area, they establish primary and alternate locations for the division's reserve regiment, missile and artillery deployment areas,* interdiction and blocking positions and counter attack deployment lines.

In the missile deployment areas, they prepare battery launch positions, fire control centers, a missile assembly area and a transport vehicle area. Provisions are made to check the launch positions for mines, to clear and level launch sites, to prepare approach routes and to thoroughly camouflage the area. If time permits, they erect hasty crew shelters. At fire control centers, missile assembly areas and transportation vehicle areas, stronger defensive structures are set up. Collapsible dugouts and shelters are set up for personnel and cut-and-cover pits are made for combat vehicles and transport vehicles.

In artillery deployment areas, they set up: gun pits and crew and ammunition shelters in the form of slit trenches, trench shelters and dugouts; command posts and fire control center facilities; hasty artillery tractor and transport vehicle pits; and approach routes. Each battalion must have primary and alternate positions. To protect guns and mortars against nuclear weapons, deeper, raised-breastwork pits are dug and tarpaulin or a non-combustible camouflage cover is drawn over the guns in the pits to protect the crews against the flash. As the defense stabilizes, dugouts are built for the gun crews, light shelters are built at the command post and deep cut-and-cover pits are made for artillery tractors.

To ensure widespread maneuverability for division reserves, plans call for deliberate preparation of deployment lines and a road system. They prepare tank and armored personnel carrier pits, artillery fire positions with hasty crew and ammunition shelters and command post facilities. Routes, (one per battalion) are prepared to move forces out of concentration areas to their lines.

Force command and control is provided by the command posts (primary, forward and rear) which have observation facilities, personnel shelters, communication and transportation equipment, landing strips, approach routes and guard and security unit positions. Mixed mine fields are set up on command post approaches. Individual command post elements are dispersed for operational convenience and to ensure stability against nuclear strikes.

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*Missile units may also have holding areas prepared. --Ed.

In the opinion of U.S. military specialists, the most important, mandatory elements of coastal defense are the engineer beach obstacles. Judging from foreign press reports, nuclear operations will be based on nuclear mine fields since it is believed that they have a large barrage effect, have a strong impact on enemy morale and can be set up in a short period of time.

Depending on the importance of the protected sector, obstacles can be set up in zones or belts. To set up these areas, plans call for using 0.02 to 49 kt nuclear land mines. They will be used primarily to destroy naval base fortifications and berthing facilities, ports, shipyard and ship repair facility slips, airfields and other major naval base targets as well as dikes, locks, dams and canals on inland waterways and bridges, crossings, tunnels, road junctions and stations on railroads and highways.

In conventional military operations, the basic element of engineer beach obstacle belts will be mixed mine fields or unmined obstacles. To set them up, plans call for using shallow water, shallow land anti-tank and anti-personnel mines. Facilities at land-based centers, naval bases and ports as well as those in the operational depth will be destroyed using delayed-action anti-vehicle mines and mined demolition charges.

According to the American press, the mixed mine fields are positioned in the water and on the beach. In the first case, they consiste of 2-4 50m-wide belts. The first belt is set up no deeper than 1.5 m. It is designed to destroy amphibious vehicles (mechanized infantry combat vehicles, tanks, APC's) with anti-tank, anti-track and belly mines which are placed in 2-6 rows and sometimes more. To keep them from being washed ashore by waves or tides, they are attached to reinforced concrete or metallic cross plates secured to the sea bed or to posts driven into the ground.

The second mine belt is positioned further out to sea than the first at a depth of 1.8-3 m and it is targeted against the assault landing craft which are bringing the assault units directly up to the beach. The third and fourth belts are positioned even further out to sea (at a depth of 4-6m). The objective of these belts is to deny assault landing craft a close-in approach to the beach.

For installing the second and subsequent mine belts, the Mk30 mod. 2 and Mk52 mod. 0 shallow-water mines are used. As pointed out by the western press, the U.S. has developed an air-laid mining system which uses the Pyranha shallow-water mine;

Plans call for using this system to lay mines in shallow water where an amphibious assault is anticipated or where one is already being conducted.

According to the accepted U.S. standards, the density of mixed mine fields laid in the water in front of the FEBA should be at least 1 and in the most suitable areas for an amphibious assault, it should be 1.5-2. The expenditure of mines per linear km of minefield may reach: 300-400 shallow-water mines, 1,100 anti-track or 500 anti-belly (all anti-tank) mines 2,500 HE or 200-300 M-18 A-1 Claymore directional fragmentation mines (anti-personnel).

When there is a large slope in the sea bed close to shore, contact mines and booms are emplaced and chains and slings are drawn through the piles. When there is a slight incline in the sea bed, mined piles, metal and reinforced concrete posts, cribs, cross plates, stone embankments and other unmined beach obstacles are emplaced. The approximately 10 m metal and reinforced concrete post obstacle belt is installed at a distance of 100-150 m from the ebb tide line at a depth of not more than 3 m. The gaps between individual elements of the beach obstacles are 1.5-9 m.

Mine fields located higher than the flood tide line usually consist of anti-tank and anti-personnel mines which are installed according to the patterns and standards for normal field conditions. Combined with the mine fields, concertina wire, hedgehog and knife-rest barbed wire belts and anti-personnel unmined obstacles may be installed directly in front of the positions. In addition to the mixed mine fields and fortifications, chemical mines and flame traps may also be used to set up the engineer beach obstacle system; if there are petroleum products in bulk oil tankers or oil dumps in the coastal defense area, plans also call for setting up curtains of fire.

In the opinion of American military specialists, the mixed mine fields on the beach and throughout the depth of the beach defense will gain time and conserve forces. In addition, they will make it possible to guarantee flank and rear area security, to delay (disrupt) an enemy amphibious assault, to slow down (restrict) his units' advance, to direct them into "killing grounds" and thereby prepare the positions for counter attacks and counter thrusts.

As pointed out in the foreign press, the mixed mine fields on the beach are subdivided into screening fields, gap fillers, flank and rear area fields. The mine fields are the basic element of these fields.

The screening mixed mine fields are located on the beach in front of the positions occupied by security and first echelon units. They are installed ahead of time in sectors suitable for an amphibious assault or accessible to tanks. Their objective is to weaken the enemy's first strike, cut the infantry off from swimming tanks and deceive the enemy as to the location of the main position.

The gap fillers are set up in the gaps between units while the flank fields are set up on their flanks.

The rear-area fields are set up according to the higher command element's decision; it determines the boundaries of the rear areas and takes steps to prevent a deep enemy penetration or envelopment of defending units.

When setting up a beach defense, the mines are only installed ahead of time on the beach in front of the water line and in the immediate depth. On subsequent lines, usually only preparations are made to lay the mine fields. These fields are made combat ready during the engagement. For safety purposes, the mine fields in front of the water line are fenced off from friendly forces while those in the depth of the defense are fenced off on all sides. As the enemy approaches them, the fences are removed.

While the mixed mine fields are being organized, preparations are made for blowing up designated installations. It is believed that the destruction of various installations will create impenetrable areas, result in barriers and fires in built-up areas and forests and will result in road bottlenecks and flooding. The NATO command allocates an important role to developing active and passive flood zones over large areas since the maritime sectors of the European Theater have a lot of regulated rivers, navigable canals on inland waterways and dikes on the shore which protect the area against flooding and which are below sea level.

While repelling an amphibious assault, plans call for building up engineer beach obstacles and destroying the previously prepared installations. To rapidly develop mixed mine fields in front of breakthrough sectors and in front of the gaps closed by nuclear strikes, widespread use will be made of land, rocket, artillery and airborne remote mining systems.

According to American press reports, the U.S. has already developed and put into service an artillery mine laying system (the RAAMS anti-tank system and the ADAM anti-personnel system) and the M56 helicopter anti-tank mine laying system. In addition, the GEMSS land-base and Gator airborne mine laying systems are in the final stages of development. For this purpose, the FRG is using the Lars multiple rocket launcher system. Its basic ammunition load includes anti-personnel mine submunitions. Land and helicopter versions of the MSM anti-tank mine laying system are being specially developed for the engineers. Great Britian has put the Ranger anti-personnel mine laying system into service. Italy has the DAT helicopter-laid mine system in service and is developing land and airborne remote mine laying systems.*

So, in the opinion of U.S. and NATO military specialists, engineer support for defense against amphibious assault will make it possible to develop the most favorable environment to destroy the enemy's amphibious assault when it is being landed on the beach and during combat for control of the coast.

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*On the NATO armies' remote mine-laying systems, see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 9, 1979, pp 32-35.--Ed.

NAVY: SOVIET REVIEW OF U.S. NAVIGATIONAL SYSTEM

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 4, Apr 80 signed to press 7 Apr 80 pp 65-70

[Article by Engr-LtCol A. Kondrat'yev: "The U.S. Navy's Transit Satellite Navigation System"]

[Excerpts] In accordance with their "realistic deterence" strategy, U.S. ruling circles allocate a special role in their aggressive plans to nuclear-powered missile submarines. Their entry into service at the end of the 50's and beginning of the 60's, as reported in the foreign press, raised a problem for American specialists--finding new navigational methods and equipment which would make it possible for submarines to determine their location with the precision required for effective missile employment.

The submarine's navigation system is based on a self-sufficient inertial system which allows it to compute its route while under way and provides data on its location at any time. In spite of the high accuracy of inertial systems, mistakes increase over time (primarily due to gyroscope drift); therefore, the systems must be periodically adjusted by introducing coordinates derived from other facilities.

Having considered this, American specialists began to develop the Transit Satellite Navigation System at the end of the 50's. It was brought on stream in 1964. The new doppler space navigation support system, which was subsequently called the NNSS (Navy Navigational Satellite System), has high accuracy, serves units located in different areas in any weather or any season and operates in the passive mode which does not require sending an interrogation signal to the satellite, a signal which could disclose the computing unit. In addition, it makes it possible for the sub to receive satellite signals while submerged using an omnidirectional, towed bouy antenna which floats on the surface. These characteristics have made this system the primary means for adjusting the autonomous inertial systems.

During the 15 years of the Transit System's operations, its uses have gradually expanded. It is being used for surface ship navigation as well as by army units and topogeodetic observers to determine their locations and also for navigational support to the merchant fleet, oceanographic, hydrographic, petroleum survey and maritime oil producing systems, fishing vessels, various floating bouys, etc. It is anticipated that the system will serve approximately 4,500 customers (of them, approximately 400 are submarines and surface ships) by the beginning of 1979.

During the system's operations, the U.S. Navy Headquarters has done a lot of work to improve it, primarily in the area of increasing its accuracy and operational performance.

The Transit Navigational System includes a group of satellites, a ground control system and a receiver-computer on the computing unit (Figure 1) [figure not reproduced].

There are 4-6 satellites in optimal orbits (from the point of view of the system's ballistic make-up).

The Transit System's satellites are in circular polar orbits, 1,000-1,100 km from the earth's surface with a 105-110 min. period of rotation; the orbit planes are uniformly distributed in space and the satellite's locations within their orbits are random. The arrangement of the orbits in space and the satellites are shown in Figure 2. [Figure not reproduced.]

Throughout the entire period of the Transit system's operational use, the Navy leadership has devoted special attention to its accuracy. For this purpose, the characteristics of the earth's gravitational field have been more accurately defined; this has made it possible to significantly (by a factor of 2 during the last 10 years) increase the accuracy for predicting the navigational satellite's orbital parameters.

In recent years, as reported in the American press, a new on-board perturbation compensation system has been developed for the factors caused by the atmospheric aerodynamic breaking effect and the solar wind's pressure; this system will be installed on a new modification of the navigational satellite (Figure 3). [Figure not reproduced.] As a result of the perturbation compensation system, the satellite will be able to maintain its orbital parameters practically unchanged over an extended period of time with a high degree of accuracy.

The satellite's orbital stability will make it possible to significantly increase the accuracy of predicting the satellite's orbital location and the accuracy of its navigational measurements; it will also make it possible to increase the prediction lead times and the intervals between projected satellite ephemerides updates to the on-board memory.

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MARSHAL KULIKOV ON WARSAW PACT TASKS AND ORGANIZATION

Moscow AGITATOR in Russian No 8, Apr 80 signed to press 1 Apr 80 pp 34-37

[Article by Mar SU V. Kulikov, Commander in Chief, Combined Warsaw Pact Armed Forces: "The Indestructible Obstacle in the Path of Aggressors"]

[Text] A quarter of a century ago--on 14 May 1955--the socialist countries of Europe signed a treaty of friendship, cooperation, and mutual assistance in Warsaw.

Opposing all subdivision of the world into opposing military blocs and groupings, the countries of the socialist fraternity were forced to create a collective defensive alliance only after all other actions they undertook with the goal of averting the threat of a new war on the European continent failed to lead to the desired results.

As we know, as early as in April 1949 the Western powers created, with the sponsorship of the USA, the largest aggressive military bloc--NATO, which included 12 capitalist countries. Aimed against the Soviet Union and other countries of socialism, the NATO bloc divided Europe into two military camps opposing one another.

Greece and Turkey were admitted to NATO in 1952. The SEATO aggressive military bloc was created in 1954, and CENTO was created in 1955. In December of 1954 a session of the NATO Council adopted a decision to outfit the bloc's armed forces with nuclear weapons. Following ratification of the Paris treaties, which gave the green light to resurrection of West German militarism, the FRG not only became a full-fledged member of NATO but also developed into the most important link in the entire system of aggressive blocs created by the imperialist powers.

Thus, 10 years after the end of World War II a new seat of war began to take shape in Europe, threatening the security of all peaceful nations, and mainly the peoples of the European socialist countries.

Further development of the international situation confirmed how right and far-reaching V. I. Lenin was when he said that people assuming the socialist path of development "necessarily need a close military and economic alliance, since otherwise the capitalists...would crush and strangle us one at a time" (Poln. sobr. soch." [Complete Collected Works], Vol 40, p 46). The combined forces of international imperialism had to be opposed by the combined power of peace-loving socialist states, and a dependable system for their collective protection and for assurance of their security had to be created.

Thus the military-political union of socialist countries, which entered history as the Warsaw Pact, came into being. Its participants today include Bulgaria, Hungary, East Germany, Poland, Romania, the USSR, and Czechoslovakia.

Creation of the Warsaw Pact had tremendous international significance. On one hand creation of a purely defensive union once again confirmed the stability of the peace-loving foreign policy of the socialist states, and on the other hand their resolve and their unbending will to defend the achievements of socialism and insure the security of the peoples were demonstrated to all the world.

The Warsaw Pact differs in content, purposes, and nature fundamentally from the military blocs of the capitalist states, which serve as an implement of war preparation and have an antinational reactionary essence and an aggressive orientation. Beginning in 1949, not a single act of imperialist aggression and not a single major military conflict occurred without the participation or support of NATO.

The Warsaw Pact is purely defensive in nature. Its participants threaten no one, they have no intentions of attacking anyone, they hold no claims upon foreign territory, and they do not interfere in the internal affairs of other countries. "We created this fraternity," said Comrade L. I. Brezhnev, "mainly to oppose the threat of imperialism, and the aggressive military blocs it has created, so that the affairs of socialism and peace could be defended by common effort."

Permeated by the ideals of cooperation and friendship among peoples, the Warsaw Pact is based on the principles of full equality of all of its participants, respect for the independence and sovereignty of states, and noninterference in the internal affairs of one another. Not one of the states that signed the pact gives up any of its rights in favor of another state, and no one gets any sort of advantages and benefits at the expense of someone else. The entire content of the pact is aimed at dependably insuring the security of each state and of the entire fraternity as a whole through the joint efforts of its participants.

The fact that only socialist states are members of the Warsaw Pact makes it quite natural that the principle of socialist internationalism rules the mutual relationship among the allied states. "We can say with a clear conscience," said Comrade L. I. Brezhnev, "that our union, our friendship, and our cooperation represent the union, friendship, and cooperation of sovereign, equal states united by common goals and interests, by the knots of comradely solidarity and mutual assistance. We proceed together, helping one another, and uniting our efforts, knowledge, and resources for the fastest movement forward."

The indestructible union of communist and workers' parties is the most important factor behind the strength of the cooperation existing between countries of the socialist fraternity, and of its guiding and organizing force. Unity and cohesion of fraternal parties are a dependable guarantee for continuous growth of the influence of the Warsaw Pact Organization upon international life and upon the entire subsequent course of historical events.

With formation of the Warsaw Pact Organization, the community of socialist countries began developing on a multilateral, collective basis. This made it possible to more-successfully solve the problems of coordinating foreign political activities, uniting economic resources and military potentials of the allied countries, and thus it immeasurably strengthened the defensive power of the socialist fraternity.

The peace-loving, defensive goals and tasks of the Warsaw Pact are also in full correspondence with the structure of the organization created on its basis. Combination of political organs necessary for coordination of foreign political efforts in the struggle for preservation and consolidation of peace and security in Europe and in the entire world with military organs responsible for strengthening the defense capabilities of the allied countries and exercising leadership over the Combined Armed Forces is a typical trait of this organization.

The supreme organ of the Warsaw Pact Organization is the Political Consultative Committee (PKK). Key issues associated with the international situation are examined and resolved, joint foreign political acts are coordinated upon, and current and long-range tasks in the struggle for peace and security of nations are defined at its meetings. The fact that meetings of the PKK are held at the supreme level--with the participation of party and government executives, raises the international authority of this organ and its decisions even higher.

In order to further improve the mechanism of political cooperation, the Committee of Foreign Affairs Ministers was created by a decision of the PKK in 1976, and it is presently functioning effectively.

Coordination of the foreign political actions of allied countries within the framework of the Warsaw Pact does not infringe upon the sovereignty and national integrity of socialist states; moreover it promotes greater strength in the world positions of socialism, expansion of the sphere of foreign political actions of each socialist country, and growth in their activity in resolution of the most important problems of modern times.

The existing system of military organs in the Warsaw Pact Organization insures dependable control of the Combined Armed Forces and constantly developing cooperation among all allied armies.

The Committee of Defense Ministers plays an important role in the military mechanism of the Warsaw Pact. It develops coordinated measures to strengthen the defense capabilities of allied states, and it discusses issues associated with military development, with raising the combat readiness of the Combined Armed Forces, with improving control over allied troops, and so on.

The Combined Command has great significance to development of cooperation between fraternal armies, and to raising their readiness for combat and for mobilization. It consistently implements decisions of the communist and workers' parties of the allied countries aimed at raising the battleworthiness of the fraternal armies, and their readiness to defend the achievements of socialism. Since 1969 the Military Council of the Combined Armed Forces has been functioning as a collective organ; it examines problems associated with improving the training of troops and staffs, and issues concerning current activities of the Combined Armed Forces (OVS). With the consent of the appropriate governments, the Commander in Chief of the OVS maintains representatives in the allied armies; their basic task is to render assistance to the national commands in training of troops assigned to the OVS, and in maintaining constant and close contact between the Combined and the national commands.

The Combined Armed Forces Headquarters is the working organ of the Committee of Defense Ministers and the control organ of the Commander in Chief. It deals with a broad range of issues associated with the life and activities of the troops and fleets within the composition of the Combined Armed Forces. The Headquarters develops annual and long-range plans of joint measures of operational and combat training, it prepares and conducts joint exercises and military games of varying scale, it generalizes the experience of troop and naval training, it writes up recommendations on use of the troops and fleets, and it participates in preparation and conduct of meetings of the Committee of Defense Ministers and the Military Council of the Combined Armed Forces, and in implementation of their decisions and recommendations.

The Technical Committee of the Combined Armed Forces was created for tasks associated with development of arms and equipment, with standardization and unification of the latter, and for coordination of the efforts of the allied armies in scientific research and experimental design; this committee is functioning productively now.

The military organs of the Warsaw Pact, the activities of which are performed in the closest contact and in interaction with the national commands of the allied armies, make a great contribution to raising the defense capabilities of the allied countries, and to development of military cooperation within the framework of the pact.

In all years of its existence, the Warsaw Pact has been an active factor of peace, a dependable implement of the security of European nations. The practical activities of the Warsaw Pact Organization irrefutably attest to the peace-loving nature of the allied socialist countries, and to their active efforts aimed at preventing division of Europe into opposing military groupings, at halting the arms race, at strengthening relaxation, and at developing peaceful cooperation among nations.

History provides many examples of how the decisive, coordinated statements by Warsaw Pact countries in defense of peace contained the actions of aggressors, forcing them to deal with the power and might of the socialist fraternity. Owing to the firm position and active opposition of Warsaw Pact states, many of the aggressive plans of imperialist powers associated with individual socialist countries as well as with nations fighting for their national independence were foiled.

The Political Consultative Committee has an extremely favorable influence upon the international situation. Its decisions, which are contained within the declarations, announcements, and communiques it adopts, reflect the unified, coordinated position of the fraternal socialist countries in relation to the most important problems of international politics.

In just recent years the Political Consultative Committee suggested a number of important initiatives that were placed at the basis of major international forums, or which were reflected in a number of important international acts.

In their sum total, the decisions of the PKK make up a concrete program of action foreseeing elimination of the causes of possible armed conflicts in Europe and in other regions of the world, consolidation of mutual trust among states, attainment of real relaxation of tension, and achievement of mutually advantageous cooperation on this basis.

However, the consistently peace-loving foreign policy course of the Warsaw Pact states is not to the taste of reactionary forces of international imperialism, mainly the ruling circles of the USA and the aggressive NATO leadership. These forces are doing everything to block the efforts of socialist countries aimed at reducing military danger, consolidating peace, and limiting the arms race, and to return the world to the times of the "cold war."

In December 1979 a session of the NATO Council responded under the USA's pressure to the Soviet Union's initiative to reduce Soviet troops and arms in Central Europe with a decision to locate new American medium-range nuclear missiles in West Europe. The militarist circles of imperialism are persistently promoting an increase in the military power of NATO and attainment of its military superiority over the armed forces of the Warsaw Pact members. This is finding its expression in the railroading of new long-range arms programs, creation of new military bases, and growth of military budgets. It would be sufficient to point out that in the next fiscal year, the USA's military expenditures will increase by $20 billion.

It became distinctly evident in recent years that the leading circles of the USA and of some other NATO countries have adopted a course leading to intensification of the military danger. The first months of 1980 were marked by further aggravation of the international situation. Capitalizing upon blatantly false fabrications about the growth of a "Soviet military threat," and speculating on events in Afghanistan, the ruling circles of the USA are trying to turn the wheels of history backward, to breathe new life into the decaying mechanism of the "cold war," and to gather together beneath its banner all forces of international reaction for a struggle against the Soviet Union and other countries of the socialist fraternity. The hegemonic expansionist policy of Beijing's rulers, who are aligning themselves more and more openly with Western imperialist circles, also offers a great danger to peace.

Under these conditions the countries of the socialist fraternity, which continue to be consistent champions of peace and security of nations, feel it their duty to maintain their defense capabilities at the appropriate level, to strengthen the Warsaw Pact Organization in every way possible, and to constantly raise the battleworthiness and combat readiness of the Combined Armed Forces such that they would always be ready to decisively meet and repel all transgressions by imperialism.

The main task the socialist states took on when they signed the Warsaw Pact was to preserve and consolidate peace and the security of nations. And, as is stated in a declaration adopted at the PKK's November 1978 conference in Moscow, the Warsaw Pact members "will do everything to see that this great task would be completed, and that mankind would enter the 21st century in the conditions of a sound peace and broad international cooperation."
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VETERANS BENEFITS: TEXT OF REVISED REGULATION

Moscow VEDOMOSTI VERKHNOGO SOVETA SOYUZA SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK in Russian No 23 (2045), 4 Jun 80 pp 408 - 409

[Ukase of the Presidium of the USSR Supreme Soviet on Further Improvements in the Pension Support for Disabled Veterans of the Great Patriotic War and the Families of Servicemen Who Were Killed at the Front]

[Text] The Presidium of the USSR Supreme Soviet resolves:

1. To increase the disability pensions, provided by the USSR law "On State Pensions," for group I and II disabled veterans of the Great Patriotic War by ten percent (within the limits of maximum pension rates).

2. To grant pensions to the wives of servicemen who were killed at the front, for the loss of a breadwinner regardless of whether they were dependent on the killed serviceman and regardless of the time they reach advanced age or the time they become disabled.

3. To establish that full pensions, without the reduction of 15 percent provided for pensioners who permanently live in rural areas and who are connected with agriculture, be granted to pensioners from the ranks of servicemen and pensioners who are receiving a pension for the loss of a breadwinner serviceman.

4. In connection with Article 1, 2, and 3 of the present ukase, to introduce the following changes and additions to the USSR law, "On State Pensions," dated 14 July 1956 (VEDOMOSTI VERKHOVNOGO SOVETA SSSR,No 15, 1956, Article 313; No 46, 1973, Article 678; No 18, 1975, Article 282; No 25, 1977, Article 382; and No 3, 1980, Article 40):

1) to state the first part of Article 51 in the following words:

"Article 51: When granting pensions to rank and file, sergeant and master sergeant conscript servicemen and their families,Articles 18 (part 1), 19, 26, 28, 29, 30, 31, 32 and 37 of the present law are accordingly used. When doing this, pensions for the loss of a breadwinner are granted to the parents and wives of servicemen who were killed at the front regardless of whether they were dependent on the killed serviceman and regardless of the time the wives of the killed servicemen reach advanced age or the time they become disabled. When granting pensions to the families of servicemen who worked as workers and employees before being called to military service, Article 36 (point 'a') of the present law is also used accordingly";

2) to add part five with the following content to Article 55: "Pensions, calculated in accordance with the present law, are increased by ten percent (within the limits of maximum pension rates) for conscript servicemen who are group I and II veterans disabled as a result of a wound, concussion or mutilation received while defending the USSR or performing other military service duties or as a result of a disease connected with their stay at the front";

3) to state Article 56 in the following words:

"Article 56. Pensions (including minimum and maximum ones) are granted on a scale of 85 percent of the norm prescribed by the present law to pensioners who live permanently in rural areas and who are connected with agriculture with the exception of pensioners from the ranks of conscript servicemen and pensioners who are receiving a pension for the loss of a breadwinner serviceman."

5. To make the present law effective from 1 May 1980.

6. To charge the USSR Council of Ministers with introducing changes arising from the present law into the Statute on the Procedure for Granting and Paying State Pensions.

Chairman of the Presidium of the USSR
Supreme Soviet L. Brezhnev

Secretary of the Presidium of the USSR
Supreme Soviet M. Georgadze

Moscow, Kremlin, 30 May 1980

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SOVIET FOREIGN POLICY: DETENTE IMPORTANCE STRESSED

LD011109 Moscow KRASNAYA ZVEZDA in Russian 29 Jul 80 p 1

[Editorial: "Time-Tested Policy"]

[Text] Socialism and peace are inseparable. This has been proved by every day of our life, starting with great October. It was precisely socialism that delivered mankind from the threat of fascist slavery. It is precisely to socialism that mankind is obliged for the fact that it has been living under conditions of peace for more than three decades. The growing economic and defense might, the high prestige and the active, concerted policy of the Soviet Union and the other socialist community countries and the firm and consistent struggle of the CPSU and the Soviet state to implement the peace program advanced by our party's 24th and 25th Congresses enabled appreciable relaxation to be achieved in the international situation in the seventies.

"Detente is the natural result of the correlation of forces which has taken shape in the world arena in recent decades," the CPSU Central Committee June (1980) plenum pointed out. "The military-strategic equilibrium achieved between the world of socialism and the world of capitalism is an achievement of fundamental, historic significance. It serves as a factor restraining imperialism's aggressive aspirations, which accords with the fundamental interests of all peoples. Any intention of shaking this equilibrium is doomed to failure."

However, the United States and NATO do not wish to reckon with the realities of the modern world. Our enemies are not ceasing their attempts to upset to the detriment of the Soviet Union and the socialist countries the military equilibrium which has evolved in the world and are continuing to undermine detente, to ship up the arms race and to fan hotbeds of tension in the Near East, the Persian Gulf region and Southeast Asia. The scale of imperialism's aggression against Afghanistan is not diminishing.

Rapprochement is taking place on an anti-Soviet basis hostile to the cause of peace between the West's aggressive circles, primarily the United States, and the Chinese leadership. Beijing is not only siding with Washington in its attempts to undermine detente but is even inciting it to toughen its anti-Soviet policy still further and calling for the creation of a "world-wide front" against the Soviet Union. The cooperation which has begun between Beijing and Washington, including in the military sphere, and which is based on anti-Sovietism, is a dangerous new phenomenon in world politics. It poses a threat to all peoples, including the peoples of the United States and China.

In this complex situation our party and state are displaying truly Leninist restraint, firmness and principledness and are upholding and implementing a proven, time-tested policy of preserving peace and ensuring the Soviet people's security and international security as a whole, not letting themselves be provoked and at the same time rebuffing imperialist pretensions.

The USSR and its allies will not allow the United States and NATO to wreck the present military-strategic equilibrium in the world arena. The Soviet Union will allow no one to talk with it from a position of strength. And we will not abandon our friends in need. There will not be a second Chile in Afghanistan. A political settlement in connection with Afghanistan depends on the cessation of aggression and other forms of external interference in that country's affairs, with appropriate guarantees that such interference will not be resumed in the future.

Our readiness to rebuff any aggressor if he encroaches upon the security of the Soviet Union and of our allies and friends must be clear to everyone. At the same time the USSR is fully determined not to allow the present tension to develop into a major tragedy and is doing everything to preserve and strengthen detente. This is confirmed by the new Soviet peace initiatives which are currently being discussed throughout the world. The new proposals aimed at ending the arms race, including resolving the question of medium-range nuclear missile weapons in Europe--proposals put forward by Comrade L.I. Brezhnev during the talks between the Soviet and FRG leaders--have received the broad support of the world public.

The party, the CPSU Central Committee June (1980) plenum resolution states, will continue to follow unswervingly the policy of the 24th and 25th congresses of strengthening the socialist states' fraternal alliance in every possible way, supporting the peoples' just struggle for freedom and independence, pursuing peaceful coexistence, curbing the arms race, preserving and developing international detente and seeking mutually advantageous cooperation in the economic, scientific and cultural spheres.

The cause of peace and progress is reliably served by the further deepening of the socialist countries' cooperation in the political, economic, defense and other spheres and by the constructive activities of their joint organizations--the Warsaw Pact and CEMA. The declaration and also the statement proposing the convening of a conference of states at the highest level, which were adopted at this May's Warsaw conference of the Warsaw Pact states' political consultative committee, contain a program of measures to eliminate hotbeds of tension and trends in international development which pose a danger to all peoples.

The U.S. attempts to intimidate the peoples with the mythical "Soviet threat," to slander the Soviet Union and to organize an economic, political and diplomatic blockade of our country have failed. The leaders of a number of Western countries have declared their intention to maintain normal trade and other relations with the USSR and to continue working together with it in the name of preserving detente. Comrade L. I. Brezhnev's talks with the president of France, the results of the FRG chancellor's visit to the USSR and contacts with other capitalist states are very significant in this respect. The great success of the Moscow olympiad, which will undoubtedly give a new boost to strengthening peace and mutual understanding among peoples, graphically attests to the bankruptcy of the American policy of diktat.

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